DOMESTIC ENGINEERING

A Weekly Record of Progress in Plumbing, Heating, Ventilation and all Matters Pertaining to Domestic Sanitation

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Its cheaper to change the air in a factory than to be constantly changing help.—Pure air promotes health and contentment among employes and increases efficiency.

VENTILATION—ITS IMPORTANCE AND BUSINESS-BUILDING OPPORTUNITIES.

VENTILATION, as one of the fundamental necessities of modern industrialism, is being widely discussed, and its vital importance recognized in official circles. Not only is this taking place in the United States, but also in Canada, the latter country at present contemplating the passage of Parliamentary statutes to bring about needed changes.

Samuel Gompers, as chairman of the Committee on Labor—including Conservation and Welfare of Workers—appointed among his divisional committees, to recommend means of protection under war conditions, one to deal with the subject of Requirements and Standards upon Heating and Ventilating. It was made a part of the National Committee on Welfare Work, the chairman being Louis A. Coolidge, who is also chairman of the Welfare Department of the National Civic Federation of which Mr. Gompers is vice-president. Werner Nygren, consulting engineer and chairman of the Divisional Committee upon Heating and Ventilation, prepared the recommendations on this subject and the essential arguments and proposed standards contained in his report are published elsewhere in this issue.

As the writer points out, there is a general lack of understanding of the purely commercial advantages to be gained by the effective ventilation of working spaces, and it is an established fact that proper provisions of this kind usually pay for themselves. He advocates the inauguration of a persistent educational campaign, among other things, and if this advice is followed by the progressive heating and ventilating men of this country, the results will be of much benefit to employer and employe.

Many people still believe that opening a window or knocking a hole in the roof constitutes all that is necessary to provide satisfactory ventilation, but this is an absurd theory and one that can be quashed without much difficulty. Ventilation is no longer a question of guesswork, neither can flat rules be laid down as to what constitutes effective ventilation in structures of various capacities. Careful consideration must be given in each instance as to the type and capacity of the building, number of employes, nature of the work, atmospheric conditions, humidity, dust, gases, etc., before a final decision can be rendered as to the type of equipment that will give the best results.

The United States Government once had a striking example of the efficiency of adequate ventilation and air conditioning when, by actual test, it was found that the number of days lost through sickness of employes was cut nearly one-half, when they moved into a new, modernly equipped building.

Where comfort and health are maintained in a factory, there is the resultant increase in efficiency and a strong possibility of a decrease in accidents in that the employe, working in a clear, pure atmosphere, is going to be more alert and watchful than where conditions are the opposite.

What is true of industrial conditions also applies to buildings, whose conditions affect the public health, such as schools, churches, auditoriums, moving picture theaters, etc. It is particularly true of moving picture theaters, which have grown so popular as to make ventilation and air-conditioning the first essential. Much progress has been made in Chicago, where it is compulsory to exhibit a certificate, issued by the Ventilation Bureau, in the lobby of the theater to prove that the equipment conforms with the ordinance.

A moving picture theater, properly ventilated, reflects its value in increased patronage and larger box office receipts, whereas, if improperly ventilated, it is a serious menace to the community and should not be tolerated. Here, as elsewhere, ventilation should be given first consideration and not an after thought, to be handled in such a manner that proper ventilation is often an impossibility.

Profitable business awaits the enterprising heating man, who familiarizes himself with ventilating and air-conditioning possibilities and places such information before the proper authorities.

OPPORTUNITY *for* BETTER VENTILATION *in* INDUSTRIAL BUILDINGS

Profitable Business May Be Developed in This Field by Investigating Local Factories and Submitting Plans For The Improvement of Atmospheric Conditions

By E. C. Allan

INDUSTRIAL conditions have changed to such an extent in the past few years, and particularly during the war, that it is readily apparent that many manufacturers have not kept pace with the times. Analyze the average factory built, say ten years ago, and you will find considerable new machinery, possibly an entirely new outfit, has been installed from time to time to improve the efficiency of the plant. This has taken place in the old, original building. In a great many instances little or no attempt has been made to improve the efficiency of the workers themselves, by providing them with the first essential in human efficiency—pure air. The existence of such conditions provides a real opportunity for aggressive plumbing and heating contractors to build up a profitable business by installing air-conditioning apparatus.

It is unreasonable to expect men to work in dilapidated run-down factory buildings, when they can make the same money with better working conditions in plants equipped with modern facilities. Sanitation and ventilation go hand in hand and contribute more to the contentment of employees than any other physical factors around the plant. By pointing out these important essentials, the progressive plumbing and heating contractor can not only build up a business that will net him handsome returns, but at the same time earn a reputation that will rank him as an industrial expert on ventilation problems.

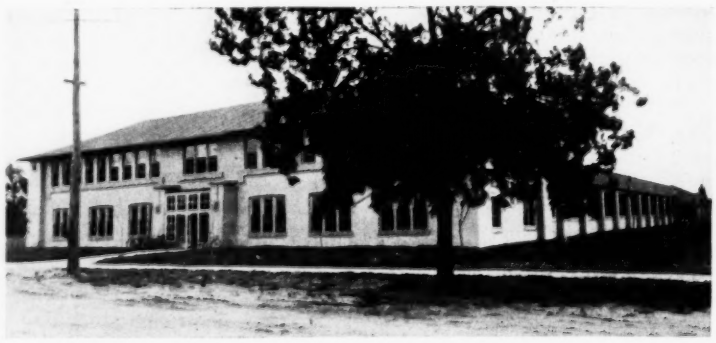

Fig. 1. A Modern Factory Needs Modern Ventilating Equipment.

One of the biggest things that a manufacturer has to consider today is the man-power of his factory. He may have the most modern machinery obtainable, but if he lacks the right kind of man-power, he cannot get the highest efficiency from his equipment. The type of men which the manufacturer can attract with the healthful, well-ventilated factory is so much superior to the flotsam and jetsam of the labor world that the manufacturer, who is not alive to this condition, will find himself left far in the rear in the race for business. All mechanical equipment should harmonize.

Many far-seeing plumbing and heating contractors realize that profitable business can be developed by concentrating in this field, and numerous instances could be cited where a shop has steadily advanced and become a leader instead of a follower. This can be accomplished by adopting an aggressive policy, going after business in an intelligent manner, selecting carefully several prosperous industries and keeping after prospects until the owner is finally convinced that it is profitable for him to install a proper system of ventilation.

With the return of our soldiers from France, many of the leading magazines throughout the country are devoting much space to industrial problems and the need of caring for these brave boys in the way they deserve. The subject of ventilation has been mentioned many, many times. These soldiers of ours have been living for nearly two years constantly in the open air. Is it right, and will such men be satisfied to return home and be forced to work in a dopey, close, dark, ill-ventilated factory? The employer is going to have a hard time keeping these men contented, whereas, if this matter is brought to his attention, and he agrees to install a system that will assure his plant of a plentiful supply of pure, fresh air, properly humidified and tempered to the right degree for health and comfort, one of the most important problems he has will be solved.

The increasing interest in the subject of better ventilation makes it comparatively easy to induce owners of industrial plants to make the necessary changes. They can be shown that it is a paying investment—one that will produce bigger dividends. Employees will become more efficient. They will be contented and stay on the job. The output will increase, both in quantity and quality, simply because the mental condition of the employee is reflected in the manufactured product.

The advent of the summer months provides a timely opportunity to go after this class of business. The necessary changes can be made to keep the men cool during the hot weather and also to insure the positive ventilation of the factory throughout the winter, when the average factory is close and stuffy and unhealthful to a great degree.

In every city you will find, often side by side, the new, modernly equipped plant with the proper facilities for positive ventilation, having the right types of fans and blowers and air-conditioning apparatus. On the other hand, there is the older plant standing out in distinct contrast. No better selling argument exists than a simple comparison of the efficiency of the former as against the inefficiency of the latter.

As a concrete illustration, analyze the factories shown in Figs. 2 and 3. The former is a very modern plant, yet it is surprising to state that the ventilation was a secondary consideration. This installation shows an excellent system and one that could be installed with profit in a great many instances. In Fig. 3 is a view of an engine works. It is very essential that the men working in this plant have a healthful atmosphere. If smoke, dust and gases are constantly circulating around the men, their efficiency is reduced and the percentage of labor turn-over unusually high. Air conditioning equipment has been installed so that no matter whether

Fig. 2.

it is in the moulding section, where fine dust and smoke prevail, or in some other part of the plant where gas and dust circulate, the air-conditioning system removes all impurities and foreign matter.

A section of a foundry is illustrated in Fig. 4, showing the location of the air ducts. A system of this type, having trunk lines and branch drops, provides positive ventilation wherever it is needed. An installation of this character is easily handled. Another interesting arrangement, showing the fans and duct work for a large factory, is reproduced in Fig. 5.

Opportunities for developing business are not confined to any particular industry or type of building—whether large or small, and once a start is made the contractor will realize how desirable and profitable this business is and will continue to cultivate it.

The best results are obtained by making a careful study of local factories, selecting those where ventilation is most needed and then going after the owner with a definite plan. It is possible to get a good knowledge of the plant without actually visiting it, though it is better to make a preliminary survey, if it can be arranged. Then, by talking with the workers, first-hand information can be obtained for atmospheric conditions. Having secured authentic facts about the plant, you can then write or call on the owner and present arguments which he cannot refute, and you have the advantage of possibly knowing more about this than he does. If he is progressive he will recognize your ingenuity

Fig. 3.

and be impressed when you give him facts and figures, and the chances are greatly in your favor of getting the job.

The cost of such installations varies, of course, with the character of the work to be done, the extent of the piping and the number of fans or blowers. You can assure your prospects that the question of adequate ventilation is no longer a hit or miss proposition and that equipment can be guaranteed to produce the desired results. In this connection the co-operation of the fan manufacturer can be depended on for engineering service.

Once you have started on this work, business will come to you. Most manufacturers belong to a local business men's organization of some kind, and they like to tell others about what they are doing in the way of improvement. How you interested him in the necessity of ventilation is pretty sure to become known sooner or later, with the result that your

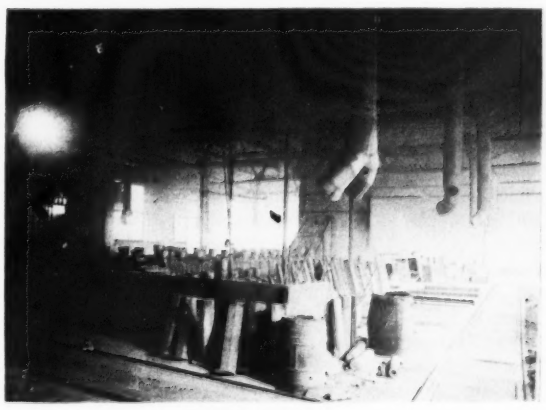

Fig. 4.

business will soon be far ahead of your competitor's, and more profitable, too.

Now is the time to get busy.

By the time this article is published, heating plants will probably be shut down and the trees starting to bud. After

being confined for six months in a factory that has been warm and possibly stuffy and unhealthy, it is to be expected that the average employee will get "Spring Fever."

Very few factory employees have the opportunity to enjoy to the fullest extent the beautiful spring and summer days that will soon be here. But it will help immensely, mentally and physically, if the manufacturer will

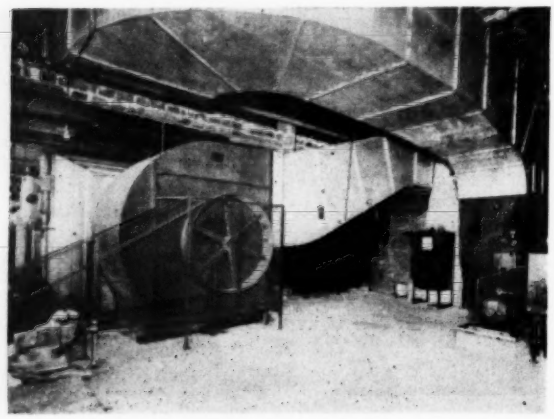

Fig. 5.

do his best to bring the great "outdoors" indoors, as far as possible, by providing an abundance of pure air for his employees to work in.

It is up to you to show him why it is profitable for him to do so—and it will be to your financial benefit also.

NEW EXPERIMENTS WITH RADIATION FROM VARIOUS SURFACES.

In a series of experiments which I made at the National Physical Laboratory, writes J. A. Harker, in a recent issue of "Nature," London, the sides of a thin cubical metal canister were painted in panels of varying color, the interior of the tube being filled with rapidly stirred oil electrically heated. The amount of pure radiation leaving each kind of surface at a series of steady temperatures up to about 200 degrees C. (392 degrees F.) was compared with that coming at the temperature from a "black body" constituted by a re-entrant tube with appropriate diaphragms. The exterior of the tube was washed by the hot oil. For temperature differences in the region of 100 degrees C. (212 degrees F.) it was found that: (1) A bright surface of ordinary tin plate only gave off an amount of radiation equal to 5-10 per cent of that from a "black body." The quality of the optical perfection of the surface was of little importance so long as it was bright. A metal surface treated with galvanit of various kinds showed effects of the same order as tin plate. Burnished copper well cleaned with metal polish gave a lower intrinsic radiation than tin. (2) A coat of almost any paint, regardless of color, brings the true radiation up to from 80-90 per cent of that of a "black body," and a quite thin layer of paper varnish or of celluloid varnish, so thin and transparent as to be almost imperceptible to the eye, applied over the bright metal, has almost the same effect. (3) A layer of tissue paper of wall paper pasted over the bright surface, or a coating of whitening or lime wash, shows the same kind of effect in restoring practically the full radiation so long as the coating is thin. (4) If the surface of the cube be metallized with aluminium paint, the pure radiation is reduced to from 45-55 per cent of that of a "black body." Much depended, however, on the kind of vehicle used for the aluminium, and different samples of aluminium paint, though giving results similar in appearance to the eye, differ considerably in the effects produced. Bronzing and such like processes produce intermediate effects.

In some later experiments, with which Mr. Ezer Griffiths was associated, a study was made of the total heat-leaving surfaces, with the view of obtaining some data as to the relative effects of conduction, convection and radiation in ordinary still air. From these experiments it would appear that in the case of low-pressure steam radiators in the region of 100 degrees C., almost exactly half the heat leaving the vertical surfaces, if these are of an ordinary character or painted in the usual manner, consists of pure radiation, the remainder being the combined effect of conduction and convection. Therefore, if, as is a very common practice, the radiators be metallized by painting with aluminium paint, the amount of heat reaching the middle of a room warmed by such radiators would be lowered by half, or double the amount of heating surface would be required to produce the same radiation effect as if the surface were black or of bare metallic iron. These results certainly have an important bearing upon the practical problems of heat transfer.

HOW TO COMPLETE THE VICTORY.

The Victory Liberty Loan is the symbol of American victory. It is the paramount thing now before the people. It is the very life of the Nation. It is the food of loyalty. It is the nourishment of peace and national security. It is the bread and meat of the American spirit.

To save money for the purchase of your share of the Victory Liberty Loan is to mingle with your body and soul the essence of the triumphs of Cantigny, Chateau Thierry, Belleau Wood and the Argonne Forest.

To undergo a little further sacrifice in your home—to forego some personal extravagance—to restrain some whim or caprice—in order that you may subscribe liberally to the Victory Liberty Loan: Why, that is to claim your part in the immortal deeds of the soldiers and Marines at the Marne Bridge on July 18, 1918.

By buying generously of the coming loan you supply vital food to the very soul of your American patriotism.

By scorning the opportunity to buy this loan you will starve your spirit, degrade your self respect, dishonor the heroes who gave their lives for you, throw slime on the flag, and spew out the principles of 1776!

Poverty is the only valid defense for failure to support the Victory Liberty Loan. If you are not too poor to buy, you MUST buy.

This Victory Liberty Loan is issued to "make good" money that has been spent to bring about the victory over the Central Empires.

Let no man tell you that this loan is put out for any other purpose.—"Victory Reveille."

Mr. Franklin said: "I have had a good many suggestions that this loan ought to be taken by the large banking interests and by the men of great wealth; that we should make no appeals to the common people; that they ought not to be called upon again. We might remind those people that this money is for war expenses and if this was not a peoples' war, I should like to know whose war it was. It was war for the freedom of the world, with the people of America vigorously back of it. And I do not believe they want to be deprived of a chance to see it through from the financial side."

HEATING *and* VENTILATION *a* NATIONAL ISSUE

Requirements and Standards for Industrial Establishments and Dwellings—Government Research Bureau Advocated—Unhygienic Atmosphere Health Menace

By Werner Nygren*

ASIDE from the aspect of humanity and justice, the securing of healthful conditions for the country's man power will add to the national strength and production which must be greater than ever to maintain our lead in the world's work. Because a well and satisfied population is foremost among our national resources, it is important to correct all working and living conditions which undermine health. To do this effectively, it is as necessary to guard against concealed menaces as those which are obvious. Many unsuspected tributaries flow into that river which leads to an early grave. Living and working in an unhygienic atmosphere is one and will so remain until it is more universally recognized that a prolonged confinement in vitiated air is injurious.

Broadly speaking, ventilation means cleanliness of the air we inhale and come in contact with, just as cleanliness of the body, more readily apparent, is provided by bathing. Positive standards as to clean atmospheric conditions would considerably simplify the problem of good ventilation, but since our senses do not reliably inform us of air contaminations it is necessary to resort to analysis to determine the degree of uncleanliness.

The complexity of the problem makes ventilation somewhat difficult to understand and introduce universally. When the mere physical function of providing comfort is accomplished by maintaining proper temperature and humidity, ventilation is readily appreciated though the amount of fresh air supplied may be insufficient for the biological and chemical functions necessary to health. Yet, when quite sufficient in all of these respects, it may still be considered insufficient, because of "closeness" or "stuffiness" which, although disagreeable, is not necessarily unhealthful. In other words, good indoor air may still be "stuffy" or even ill smelling and offensive to the senses.

To the layman, this confusion is increased by the diverse theories and controversies of scientists as to whether the physical or chemical functions to be performed by ventilation are the more important; whether the air naturally introduced through the windows or artificially by mechanical means is the healthier, et cetera.

Production Increased.

There is a general lack of understanding of the purely commercial advantages to be gained by effective ventilation of working spaces. No apprehension need be felt that inordinate expenses will be involved, since proper provisions of this kind usually pay for themselves.

A persistent educational campaign should be inaugurated. Articles on ventilation in simple language should be issued explaining the benefits derived from proper ventilation to be followed by statistics upon health standards obtained from striking instances of well-ventilated and poorly ventilated establishments.

In *maintaining and improving the working and living conditions of the industrial and public employes*, the definition of welfare work formulated by Samuel Gompers for the Committee on Labor's War Work, so far as the surrounding air is concerned, all set notions or problematic theories must be discarded.

Good ventilation means a sufficiently active dilution of the indoor atmosphere to maintain comfort and health. It is necessary when considering the requirements to determine the minimum limits of ventilation to avoid needless expense of installation and operation, and unreasonable structural demands to accommodate the ventilating apparatus. The problem, in every individual case, resolves itself into satisfying the requirements of those physical and other functions which make the greater demand. Usually the greater amount of air is required to carry away heat and moisture. A human being, laboring or resting cannot possibly be surrounded by air that is too fresh, provided there are no objectionable drafts.

Laws, with established standards for ventilation and heating, have been enacted in various states. Predetermined standards are valuable for ordinary and simple conditions. For exceptional conditions, which usually are the most difficult, set standards are not possible. The laws are therefore mostly inefficient. They are further deficient in that they sometimes establish standards on the basis of quantity without stipulating the minimum quality results, the latter fixing a better test and capable of a broader application to varying problems.

Chemical Analyses.

By measuring the properties of the atmosphere, the same as is done for heating, cooling, humidifying and dehumidifying, it should be possible to determine whether or not quarters for working men are healthy, and this should be the deciding test for all doubtful cases. The formerly much used carbon-dioxide test gives only an indication of the dilution of the room atmosphere and is of no value for ascertaining the presence of bacteria, injurious gases and other unhealthful ingredients. There is no reason why the quality of atmospheric conditions in working quarters and elsewhere should not be a matter worthy of Government control. Consideration should be

*In "The National Civic Federation Review."

given to the establishment of such a bureau to supervise and control all matters pertaining to ventilation, to gather and tabulate statistics of the respective health conditions, and to include a laboratory for research and testing work, in charge of a competent and well-paid personnel, to inspire confidence; its creation would be appreciated by every health board and health association in the country.

In heating and ventilating we are confronted with the two problems of meeting the requirements in new and in old buildings oftentimes utilized for purposes for which they were not originally constructed.

For new buildings, except that they cannot be equally definite, laws can be enacted to cover heating and ventilating along lines similar to those controlling building construction and plumbing. Existing building laws, with few exceptions, can be enforced almost literally. Ninety per cent of the work can be carried out in strict accordance with predetermined standards, leaving 10 per cent to the judgment of officials, whereas in heating and ventilating the greater percentage of work has to be done in accordance with judgment of special conditions.

Window Ventilation.

The limitation of ventilating by opening windows is mainly responsible for the development of mechanical methods. In crowded establishments the windows cannot, under unfavorable weather conditions, be kept open sufficiently to accomplish the necessary air dilution without harmful and disagreeable drafts and chilling effects, and there are not always winds to force in the required amount when open windows can be tolerated. In other words, window ventilation cannot be depended upon nor effectively controlled. It usually, though not always, requires reenforcement with positive and reliable devices which will work when natural agencies fail or are insufficient. The old theory that the opening of windows destroys the effect of mechanical ventilation is not supported. Opening of windows is often sufficient for small offices and private rooms where the occupants are at liberty to manipulate them to suit their own comfort. Proper allowance should be made for unavoidable air leakage which secures some ventilation even when windows are closed and for the sterilizing effect obtained by sunlight. Rooms having no windows or skylights, particularly if they happen to be underground and interior and without any wall exposure, require specially good ventilation by mechanical means.

Points of Special Importance.

First.—All air supplied for ventilating purposes should be free from dust, pathogenetic bacteria and other contamination.

Second.—A sufficient amount of air, properly tempered and distributed, requires to be supplied per person to satisfy both the biological and physical functions of the human organism, and the governing factor determining the amount required must be that function which makes the greater demands.

Third.—Ample allowance must be made for the combustion of gas and oil burnt for illumination and other purposes, as this vitiates the air and adds undesirable heat, and additional ventilation must be provided fully to offset these effects.

Fourth.—The room temperature should be kept as constant and agreeable for the occupants as possible, overheating being as objectionable as underheating.

Fifth.—Proper attention should be given to the subject of the humidity and the necessity of supplying additional moisture under extremely dry conditions and removing excessive moisture under reverse conditions. The latter is especially important when a high temperature is associated with a high relative humidity which combination is injurious to health besides causing discomfort.

Sixth.—Rapid air currents causing drafts must be avoided. While such currents increase the heat dissipation from the body and produce a certain comfort in hot weather, they are injurious to those who by necessity must remain in their path when air at a comparatively low temperature is introduced.

Seventh.—Excessive heat, vapor and injurious substances arising from manufacturing processes or other causes require to be locally removed and thus prevented from being communicated to the room atmosphere, and all toilet, locker and other rooms of similar character require positive exhaust ventilation for the combined purpose of ventilating them and preventing odors from spreading to adjoining rooms.

Eighth.—Radiators and coils representing heating surfaces require individual controlling devices either for hand operation or automatic, and such heating surfaces must be so located and arranged that they will not cause discomfort.

Ninth.—Hot surfaces, which by nature of their use do not require to be exposed, should be insulated by nonconducting material. This includes steam and other hot piping and metal surfaces of machinery, as well as walls and floors which have high temperatures and cause discomfort both by direct heating up of the room air and by the effects from radiation or contact.

Tenth.—The matter of design is as important and vital as the air quantities supplied. Many ventilating and heating installations which are ample in capacity are, nevertheless, inadequate on account of faulty arrangements. The heating and ventilating science is often considered so simple that the design of the apparatus is intrusted either to those having little or no previous experience, or to manufacturers mainly interested in finding a market for their special appliances and who consider their duty fulfilled when the apparatus delivers the quantities of air and heat required by the contract. If the apparatus is to be successful in maintaining proper atmospheric conditions, too much attention cannot be given to detail of arrangement and distribution of the heat and air introduced.

Ventilating, Heating and Air Moistening.

The quantities of fresh air, heat and moisture required depend upon conditions. The standards hereinafter given are ample in their provisions to secure atmospheric conditions which will promote health and comfort with a reasonable and yet not undue margin of safety. These standards cover the requirements of indoor conditions generally encountered, with recommendations for special provisions against contamination developed with manufacturing processes of a particular nature. They take into account that the occupants are confined for hours and that but brief periods of the working day are available for airing and cooling the rooms.

Less air dilution than that given by the standards may answer for rooms and quarters occupied for only short periods and for rooms having liberal window areas of such exposures as to permit of penetration of direct rays of the sun to all parts. Working quarters, however, seldom come under this head. The stated requirements should, therefore, be considered the minimum, and while they can with advantage be increased, they should not at any time be decreased.

For rooms and work shops in which undue heat, dust, fumes, vapors, odors, or other impurities are created and released, special means should be provided for exhausting and collecting those harmful substances immediately after and where they are generated. If this is not done and

such heat and substances are permitted to mingle with the air, unhealthful conditions will be produced which cannot be entirely eliminated by air dilution, even if the same is increased far beyond that given in the standards.

Standards.

Minimum requirements to maintain acceptable conditions in all classes of factories, rooms, and spaces devoted to industries follow: Included are offices, stock, sorting, shipping, wash, dressing, locker and toilet rooms.

Two hundred and fifty cu. ft. of space is the minimum for each occupant, the work room being 12½ ft. or less in height. If the height exceeds 12½ ft. there should be at least 20 sq. ft. of floor space per occupant.

Rooms having windows whose area is equal to or in excess of 21 sq. ft. per occupant and which open directly outdoors, do not require mechanical means for ventilation except when injurious substances are released or undue heat is generated.

Interior rooms and those having less window area than 21 sq. ft. per occupant require apparatus for mechanical ventilation, to be operated whenever occupied except when external temperature permits keeping windows wide open, provided the total window area is not less than 5 sq. ft. per occupant. A positive supply of outdoor air from an uncontaminated source should be supplied to each room in this class, the amount being stipulated later, and distributed so as to maintain the stipulated temperature without harmful drafts. Sufficient means should also be provided for each room for exit of air corresponding in volume to the amount of fresh air supplied. The exit opening should be so arranged that the movement of the air will be given a direction whereby it will come into maximum contact with occupants, and should, when necessary, be provided with mechanical or other positive means for exhausting it. Rooms having a total area of windows opening directly outdoors amounting to less than 21 sq. ft. per occupant require fresh air in the quantity of not less than 100 cu. ft. per occupant per hour for each sq. ft. of window area lacking, excepting that when mechanical ventilation becomes necessary the minimum amount supplied should be not less than 600 cu. ft. of air per person per hour.

Rooms above the ground level having wall or ceiling exposure, but no windows, require 2,100 cu. ft. per occupant per hour.

Interior rooms having neither exposure nor windows opening directly outdoors require a quantity of air per hour equal to five times their cubic contents, plus, 1,200 cu. ft. per hour for each and every occupant.

Underground rooms having neither exposure nor windows opening directly outdoors require a quantity of air per hour equal to six times their cubic contents plus 900 cu. ft. per hour for each and every occupant.

Toilet, coat and locker rooms require mechanical ventilation capable of exhausting air from such rooms in the following amounts:

Toilets, at least 10 complete air changes per hour, plus 1,500 cu. ft. per hour for each water closet and urinal fixture.

Locker and coat rooms, at least six complete air changes per hour, plus 600 cu. ft. per hour for each locker or each person's wearing apparel.

Sufficient air inlets for inflow of air to replace the air exhausted should also be provided.

Areas of doors and skylights which can be freely opened may be considered equivalent to window area.

Removal of Injurious Substances.

Where dust, fumes, gases, vapors, odors, fibers or other impurities are created or released in the course of manufacturing, tending to discomfort and injury of health, there should be provided special mechanical or other positive means for removing such substances as fast as created or released.

In case of inability completely to collect and remove injurious substances such additional ventilation is required for dilution of the atmosphere beyond the standards given above as is required to maintain its purity. The percentage of injurious substances permissible should be determined by chemical analyses by medical authorities. This provision should cover all gas burned for illuminating or other purposes from which the products of combustion are released to the indoor atmosphere, and the allowance for such contamination by gas, etc., must be not less than 1,800 cu. ft. of fresh air per hour for each cu. ft. of gas burned within the room.

When, in the opinion of the proper authorities, the fresh air supplied for ventilating purposes is dust laden to the extent of being unhealthful and unsuitable, it should be filtered or washed by suitable appliances capable of removing dust and other mechanical impurities.

Excessive Temperature and Humidity.

Excessive heat generated by manufacturing processes should either be confined by application of non-conducting material or be collected and carried off in the same manner as described for injurious substances.

Excessive heat or humidity or a combination of the two when sufficiently high to be injurious must be counteracted or reduced so that the relative humidity will not exceed 65 per cent when the temperature exceeds 75 degrees F., except when outdoor weather conditions prevent or when the working quarters are used for special purposes which, in the opinion of the proper authorities, require or make advisable other degrees of humidity.

The minimum relative humidity for the stipulated temperatures should be not less than 20 per cent and suitable air moistening appliances, controlled either by hand or automatically, should be provided in the rooms or in connection with the ventilating apparatus.

Heating Requirements.

The temperatures in all factories, mercantile establishments, mills and work shops should be maintained at a uniform degree consistent with reasonable requirements of the manufacturing processes, ranging from 62 degrees F., the minimum for rooms in which manual labor is performed, to 72 degrees F., the maximum for rooms in which clerical or mental work is performed.

Heating apparatus must be of a type to cause no contamination. All direct heating surfaces should be so arranged that the heat radiation will not cause discomfort or injury.

When warm air is used as a heating medium it must be so introduced and distributed as not to cause discomfort and must not be supplied at a temperature higher than 130 degrees F.

Open salamanders must not be used under any circumstances.

Gas or oil heating appliances, discharging their products of combustion into rooms, must not be used unless a sufficient amount of fresh air is supplied to compensate for the vitiation. Gas heating appliances can be used without additional air supply if the products of the combustion are completely collected at the points where generated and carried off.

Suggestions for Dwellings.

While it is as important to maintain pure atmospheric conditions in the homes as in the working quarters, it is neither reasonable to advocate nor practicable to install

(Continued on Page 86.)

SOMETHING ABOUT BACK-VENTING PLUMBING FIXTURES *in* LARGE TOILET ROOMS

How to Lay Out Toilet Room Piping to Simplify Venting, Yet Obtain Perfect Ventilation in All Parts of the System

By Robert J. Gordon

IN preceding chapters we mentioned the necessity of thorough ventilation of house drainage systems, also made some reference to anti-siphon traps, etc., with relation to ventilation. We even stepped a little into the domain of simplified venting, but not very far. We showed a case of a soil stack having one closet, and two lavatories without any back-venting at all, and stated that the particular case in question might be considered quite sanitary without back-venting.

In this article we will try to study back-venting in a more specific way. We will try to show different arrangements that may be conceived and installed for a given toilet room.

You know different sanitary engineers and plumbers have different ways of doing things, yet each may be quite

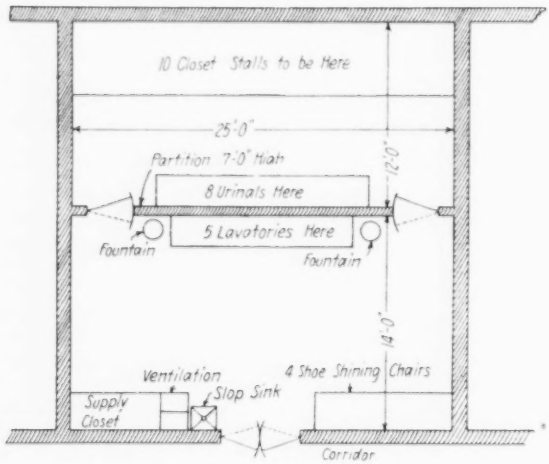

Fig. 1.

correct and proper. No man can justly claim that his way is the only correct way to do things. Any man taking that position is an ignorant egotist. There are lots of ways of killing a cat. You can drown it, shoot it, gas it, starve it, or lock it in a room with a fox terrier; quite a diversity, yet each plan will be successful.

So it is with plumbing. There are lots of different ways of running the pipes, locating the fixtures, etc., etc., that are quite successful, are in accordance with our modern plumbing codes, and meet the severest demands of modern sanitary science.

Suppose we have to design a plumbing system for a vertical tier of toilet rooms in a four or five-story building.

Suppose each toilet room on each floor will be the same as shown in Fig. 1.

Suppose the architect hands you a blue print, showing the arrangement of the fixtures, as he wants them, and that arrangement is the same as in Fig. 1. And suppose he asks you to make up a plumbing plan for these toilet rooms, showing the soil, waste and vent pipes, an inside roof leader pipe and the hot and cold, and ice water stacks.

How would you go about it?

You are informed that your plan will terminate at floor of lowest toilet room, which is well above the sewer.

All water risers will be up-feed, as the street pressure is 80 pounds, and there is no tank in the building. This makes the pressure on top floor, say, 45 pounds, static.

How would you go about it, particularly with reference to the back-venting, which appears to be the absorbing topic of the day in plumbing circles?

The following is how the writer might attempt it:

Studying Fig. 1 we note the width of toilet room is 25 ft. This has to take in 10 closet compartments. That makes each compartment 30 inches wide from center to center of partitions, if the available space is divided equally among the compartments.

But the question of pipe stacks comes up. To obtain an economical, yet efficient, system of ventilation, the writer would run the soil stack up in one corner of the end compartment, and its corresponding vent stack up in the corner of the other end compartment. The leader and cold water riser for closets also may run up in either corner very advantageously.

If these stacks can be run in chases in the walls, then they will not interfere with the aforesaid compartment width of 30 inches. But if they have to run on the face of walls, then allowance should be made for them in some way. That is to say the two end compartments may be made, say 6 inches wider than the others, so that the piping will not interfere with the accommodations.

The writer, therefore, would reduce the width of the eight intermediate compartments 1½ inches. This gives one foot to divide between the two end compartments,

making them 36 inches wide each. That makes them each 7½ inches wider than the others, which is enough to take in the stacks and their connections. Twenty-eight and one-half inches is wide enough for a water closet compartment, ordinarily. If a man is too large to be comfortable in one of them, he can use one of the end compartments. An ordinary man will fit nicely into a 28-inch compartment, especially if it is quite deep, say 5 ft. or more.

Let us suppose that the stacks must be run on the face of the wall, and arrange the toilets that way, the dimensions of which are shown in Fig. 2.

Referring to Fig. 1 again, we note that the architect wishes eight urinals on the water closet side of the partition. The width of the room is 25 ft. The overall width of each urinal is, say 2 ft. The urinals will occupy a space of 8×2=16 ft. This leaves 25—16=9 ft., to be divided between the two doors, at each end of the urinal battery. That gives 4 ft. 6 inches at each end, which is plenty.

The architect shows a door at each end. The writer would suggest that the doors be omitted here, as it is impossible for any person in the corridor seeing the water closets. The partition between the urinals and lavatories hides the closets from view. Furthermore there is liable to be confusion and bumping when people go out and in through the same door. That is a suggestion the writer would put before the architect, when he submitted his plumbing plans. But he would prepare his plans so that the architect's decision, whether for door or no door, would not affect the plumbing layout. Fig. 2 shows clearly how the urinals would appear as laid out this way. The partition would stop at ends of urinals.

Studying Fig. 1, again we note that the architect calls for five lavatories to be set on the entrance side of partition and about central with the room. Assuming that each lavatory occupies a space of 27 inches which is reasonable for this case, then the row of lavatories will be about 11 ft. 3 inches long. That leaves 16 ft. minus 11 ft.

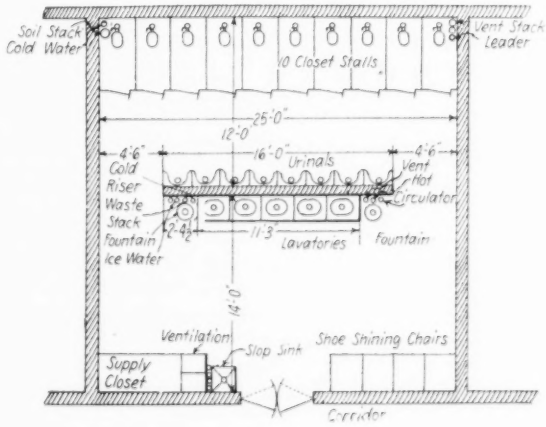

Fig. 2.

3 inches, which equals 4 ft. 9 inches to be divided between the two drinking fountains shown, or 2 ft. 4½ inches for each fountain. That amount of space is about right. It is enough to allow a person to stoop and drink at a bubble without blocking the way to the closet compartments. So far the amount of fixtures required and the space happen to work together fine, and the general layout is good. The urinals and lavatories are bunched back to back, which is a good layout. The slop sink, however, is rather isolated. It is seen near the entrance door, which is a double door, swinging both ways. No special designing is required here—just set the slop sink against the wall—that's all. But the question of piping for same is another matter, and will be considered as we go along.

Up to the present we have assumed that all piping has to be on face of walls. That system is quite suitable for mills, factories, etc., where everything is utilitarian and sanitary. If the building is of sufficient importance to warrant concealing all piping in toilet rooms, the layout of

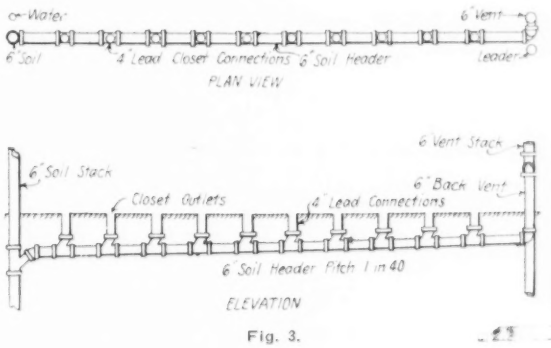

Fig. 3.

piping would be different. The layout we propose to make now is on the supposition that all stacks will be open, and no pipe shafts or pipe spaces will exist between walls or in walls.

Fig. 2 shows, in addition to the fixtures in accurate position, the location of the several stacks necessary to conveniently supply these fixtures. Note the soil stack and the cold water riser for flush valves. They are located in the left-hand water closet compartment and out of the way. The right-hand compartment contains the vent stack and the leader with ample space between them for the vent connections at each floor. These soil and vent stacks, also the leader, probably will be 6 inches, the vent being full size of soil stack to insure ample and free ventilation.

The waste stack for urinals, lavatories and bubbling fountains is at left-hand end of lavatory battery. Alongside of this are the cold water, and ice water risers and ice water circulation, making four risers there.

At the opposite end of lavatories are the vent stack, the hot water riser and circulation riser, making three risers there.

If it is a factory building, which we assume it is in this layout, these risers will run up from floor to floor. They will hang down from ceiling openly like so many ropes, and will not be much of an ornament, but they will not be any worse in appearance than the belting, shafting or sprinkler system, elsewhere in the building, and they will be mechanically correct and sanitarily perfect.

The stacks at side of slop sink are 3-inch waste stack, 3-inch vent stack, cold water riser, hot water riser and circulation pipe. These are shown located against the wall which forms the flue that ventilates the entire toilet room by exhaust flue ventilation.

A detail drawing, showing a simple and effective way to connect up all the closets, is shown in Fig. 3. A 6-inch soil pipe header runs along under all the closets and takes in each closet with a 6x4-inch long-sweep, sanitary tee. A 4-inch, 8-pound lead pipe runs up through floor from sanitary tee for each closet. It connects into hub of sanitary tee with a 4-inch brass ferrule and wiped joint, the ferrule being calked into the hub. If it is a Durham job a 4-inch brass male screw nipple would be wiped to the lead pipe and screwed into the threaded outlet of the Y fitting.

Under each closet is a strong, brass closet flange securely soldered or wiped to the lead closet connection. To protect the lead from corrosive action of the concrete, it should be painted with R. I. W. or similar asphaltum paint and then wrapped with asphaltum roofing felt wired on. Owing to the fact that these closet connections are quite rigid, it is necessary to have the soil and vent stacks very firmly supported at their bases to prevent them from settling at any time and tearing away the lead connections under the closets.

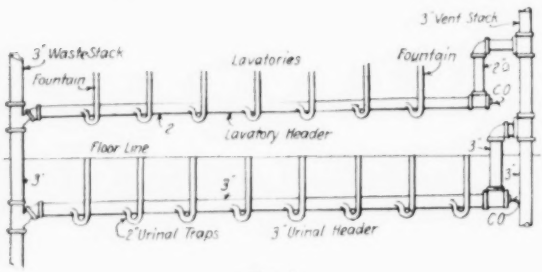

Fig. 4.

No hot water goes into this soil stack to expand it unduly, therefore, this form of connection will give good service. The writer has installed many batteries of closets this way, with excellent results, but he was careful to have bases of stacks rest on stone corbels built in wall at basement, on which the stacks are set with heel rest bends.

Now note how the ventilation of the battery of closets is accomplished, as this is the kernel of our present article. Note that the closet branches are not ventilated individually by separate back-vents. They are ventilated exclusively by the upper end of soil header, being connected into the vent stack at a point higher than closet seats. This is a continuous vent. The soil header is continued, taken up through toilet room floor between vent stack and leader stack, then turns with a quarter bend and enters side of stack. This vent is very short, being probably 5 ft. to 6 ft. long. It costs just about as much to reduce it to 4-inch as it does to make it the full size of the soil header. Therefore, the writer prefers to extend it full size as shown. In doing so he obtains better ventilation at practically the same cost. The pipes and fittings are all one size, and reducing pieces with their extra calked joints are avoided. He knows that a 4-inch vent extension from 6-inch soil header to 6-inch vent stack will do excellent service in this case; but figure up the difference in cost, and you will see that there is very little saving, if any, in a 4-inch vent here.

The question is: "How are the short lead closet branches ventilated and is such ventilation sufficient?" They are ventilated by diffusion, and the ventilation is sufficient, providing the lengths of the branches do not exceed certain limits.

In our last article on house drainage ventilation, you remember, we suggested a 10 to 1 limit. On that basis, which the writer thinks is quite safe and sanitary practice, a 4-inch branch, shorter than 40 inches, can be well ventilated by diffusion, providing the air passing across its open mouth is fresh or nearly so. If such air current is stagnant, foul, or nearly so, then branches which depend upon ventilation by diffusion with such air currents cannot possibly be properly ventilated.

A necessary thing in ventilation of this kind is to have a large volume of fresh air flowing through the main drainage sections, so that short branches connected thereto will have a chance to diffuse their gases with the fresh main air currents. If this is not done right, then any attempt at diffusion ventilation will be a failure.

The makers of modern plumbing codes, realizing that great fundamental fact, have wisely incorporated into the codes certain rules, which compel venting in a full and wholesome manner. They do not wish to run any risk at all with foul air main currents and gas laden dead vents. So in many codes we find full back-venting, which is undoubtedly the safest and best plan. In other codes, however, we find that main current venting is compulsory, while dead ends of a certain length and kind are permitted. But it is wrong to allow dead end branches of unlimited length, and it is wrong to have vent stacks and back-vents too small. Some of the best-posted sanitary engineers of the day, those who make plumbing plans for the biggest and best buildings in America, realizing the great value of drainage ventilation, are now making vent stacks larger than the soil and waste stacks.

That is progress based on science and experience.

But those people who make it their business to kill back-venting either by writing books, articles, pamphlets, etc., or by lectures and the like, are simply trying to drive a peg into our trade's progress. Indeed, their campaign of education along this line is very detrimental to public health and should be fought down by sanitary engineers, plumbing contractors, health officials and others interested in public health and our nation's welfare. There is but little room in America today for the man who preaches retrogression. What we need and what we want is progress, *upward and onward*. Nothing less will do for our live and wide-awake people.

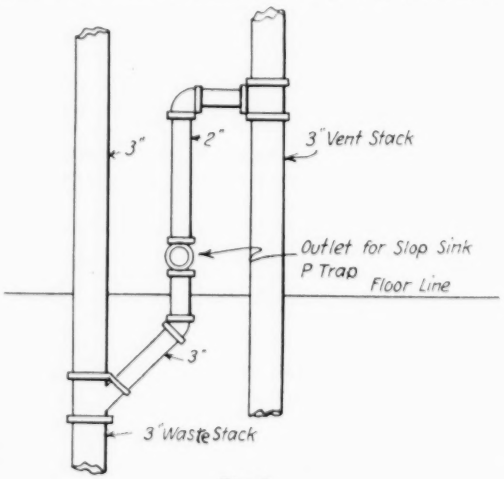

Fig. 5.

Now examine the layout at the urinals and lavatories. Note the stacks running up against partition at back of the fountains, which are furnished with filtered ice water circulated through tin-lined pipes. Observe the waste stack at one end of range and the vent stack at opposite end.

The urinals are operated by the individuals, who use them, either by foot push or hand push valves. They are not all flushed at once by an automatic tank. Therefore, the waste header is not deluged. Such an arrangement will work very satisfactorily. The waste header for lavatories is continued 2-inch and connected into the vent stack, say 3 ft. above the finished floor. The plan is shown in elevation in Fig. 4 and explains itself.

(Continued on Page 86.)

LEGAL QUESTIONNAIRE

*Will Receipt in Full, When Only Part of Bill is Paid, be Binding, If the Claim is Disputed?—This Question is Answered in a Most Careful Manner**

By "The Judge"

Receipt in Full, When Only Part of Bill Is Paid, May Not Be Binding, If the Claim Is Disputed.

Editor "Domestic Engineering":—When making settlement of a bill owed me by a customer, recently, I agreed to take $75 in full settlement of charges on my books of nearly one hundred dollars. I did not agree that my bill was wrong, but simply agreed to take the smaller amount in payment. The customer's check came back in a few days, marked "Insufficient Funds." I am determined now to get the full amount of my bill, if possible. One of my friends tells me that I shall have to bring suit on the check, and not my bill, for that part of it which is represented by the check. Is this right? Also please tell me whether I am in a position to collect all of my bill, although I accepted a part of it in full payment.

B. M. T.

Answer:—Where the debt or demand is liquidated, or certain, and is due, payment by the debtor and receipt by the creditor of a less sum is not a satisfaction or payment of the whole debt, although the creditor agrees to accept it as such, if there be no release under seal or no new consideration given by the debtor. A liquidated claim, speaking broadly, is one which has been ascertained to be due, either by a court or by agreement of the parties. Your claim would probably fall within this class of cases, as it is certain and due, and would be distinguished from an unliquidated or uncertain claim for damages in an accident case. One of the important features of the above rule is the necessity that the debt must be due at the time part payment is made to the creditor. As an example: If a customer owed you a note due January 1, 1919, and did not make payment upon the due date, and you should accept part payment in full after that date, you could turn around and sue for the balance due, if you had not given a release under seal or no new consideration had been given. On the other hand, if the maker of the note came to you on December 31, 1918, a day before the note was due, and offered to take it up for a less amount than the amount due you, a part payment would be payment in full if you so received it, and you could not collect the balance.

It is sometimes hard for the ordinary man to appreciate the rule of law involved in these cases. The court will not say that $75 in money is payment of $100 debt due, but it will say that $75 paid before it is due may be worth $100 to the person to whom it is owed, and it will not go into the question whether it is actually worth $100 or not, because something more than money is involved. If you owe a man $100, and he should say to you: "If you will give me $1 and will walk around this building once, I will give you a receipt in full," and you should pay him the $1 and should walk around the building once, the other fellow could not thereafter successfully sue you for the other $99. The court would say that it was for the parties to decide whether walking around the house was worth $99, and it will not go into the question of the sufficiency of the consideration for the release of the payment of the other $99 in money. However, a court will find that where cash only is involved, $75 is not payment of $100.

Payment of a less amount than is due operates only as a discharge of the amount paid, leaving the balance still due, and the creditor may sue therefor, notwithstanding the agreement. In fact, in many states, even where a check has written upon it, over the space on which the payee usually makes his endorsement, some legend to the effect that the check is received in full payment of the invoice noted on the check, it is held that the endorsement of such a check, and deposit and collection of it, does not prevent the payee from suing for any balance due him. It is becoming more and more usual, especially in the case of large business firms, for the maker of a check to place upon his paper some statement of the materials or services for which a check is due, with the further provision that endorsement of the check shall operate as a payment in full for the charges appearing. The authorities are not at all in accord on this subject, some states holding one way and others exactly the opposite.

Even in those states where it is held that an endorsement as being in full payment does not necessarily bind the payee, it is further ruled that the payee, if he does not accept the check in full payment, must so notify the maker. But the payee may endorse and cash the check and notify the maker that he does not accept it in full payment and then may sue for the balance due.

In one case in your state a check was given in payment of a disputed claim, with the following, among other things, written upon the paper: "In full settlement of invoices enumerated hereunder, etc.," and "should the above items be incorrect, return this check with explanation by return mail." The receiver of the check endorsed it and then immediately notified the maker of the check that it demanded a balance still due. In this case the court said:

"Cases in which debtors have undertaken to force a settlement upon their creditors by sending a check in full discharge of a disputed account have given rise to more than one question upon which there is a conflict of authorities. It was decided in England, that a creditor, who cashes a check sent in full settlement, is not barred from contending that he did not agree to take it on the terms, on which it was sent, if at the time he accepts it, he says that he takes it on account. The ground of that decision was that to make out the defense of accord and satisfaction the debtor must prove an agreement by the creditor to take the sum in settlement of the account, and that, if the creditor in

*Every Effort is made to the End that these Answers may be authoritative. However, we cannot assume any Responsibility because of the very Nature of the Service, which is rendered without a personal Interview.—Editor.

taking the check notifies the debtor, he accepts it on account and that he refuses to accept it in full settlement, the debtor, as a matter of law, has not proved an agreement on the part of the creditor to accept the check in satisfaction of the claim . . . . ."

Continuing the Court said: "But the true rule is to the contrary. The plaintiff could only accept the money as it was offered, which was in satisfaction of his demand. He could not accept the benefit and reject the condition. When he endorsed and collected the check referred to in the letter asking him to sign the enclosed receipt in full, it was the same, in legal effect, as if he had signed and returned the receipt, because acceptance of the check was a conclusive election to be bound by the condition upon which the check was offered. And to that effect is the weight of authority."

It is very important to keep the exact situation clearly in mind in each case that the true rule may be understood. A distinction is made between cases, where a dispute arises between the parties as to what is really due, and a part payment of the creditor's original claim is received in full settlement. In such a case the majority of courts rule that such a part payment is payment in full, for the claim is in reality not certain and is unliquidated. On the other hand is the kind of case where there is no dispute of the amount due, but the creditor receives a part payment in full. In this latter case he may turn around and sue for the balance.

Then there is the further class of cases, which at first glance may seem very much like the first class just mentioned, which involve the payment of the undisputed part of a claim, with legends on the check to the effect that the check is received in full settlement of the full amount of the claim. In the court decision quoted from above, the Court ruled regarding this class of cases as follows:

"But in cases, where there is a dispute as to the amount due under a contract and payment of an amount which the debtor admits to be due is made by the debtor in discharge of the whole contract, further and other questions arise.

"The question whether the creditor, who under these circumstances accepts such a payment, protesting that he takes it on account, is or is not barred, is a question upon which the authorities are in conflict. Citing various state decisions, the following states hold that the creditor cannot successfully sue for the balance claimed to be due: New York, Illinois, Nebraska, Kansas, Rhode Island, Kentucky and Missouri; and the following courts hold that he may sue for the balance due: Minnesota, Washington and Maryland.

"The decision in most of these cases was made to turn upon the question whether payment of the amount admitted to be due without dispute did or did not constitute a valid consideration for the discharge of the balance of the debt about which there was a dispute.

"In the cases before us there was no express agreement by the creditor to forego the balance of his claim upon receiving payment of the amount admitted to be due without dispute. The only way, in which such an agreement can be made out in the case before us, is on the ground that the plaintiff had to take the check sent him on the condition on which it was sent, and that by cashing the check he elected to accept the condition and so took the part admittedly due in full discharge of the whole debt. But while the doctrine of election is sound, where a check is sent in full discharge of a claim no part of which is admitted to be due, it does not obtain where a debtor undertakes to make a payment of what he admits to be due conditioned on its being accepted in discharge of what is in dispute. Such a condition, under those circumstances, is one which the debtor has no right to impose, and for that reason is void. He can take the payment admittedly due free of the void condition, which the debtor has sought to impose. Take an example: Suppose the defendant had agreed to deliver to the plaintiff a stipulated quantity of iron for a stipulated price during each month of the year, and after six months the market price of iron was double that stipulated in the contract. Suppose further that the defendant on the seventh month sent the stipulated amount of iron but on condition that the plaintiff should pay double the stipulated price, can there be any doubt of the plaintiff's right to retain the iron without paying the double price? That is to say, can there be any doubt that the condition, which required the plaintiff to pay double the contract price for the instalments sent, was void, and that the plaintiff under those circumstances is not put to an election but can keep the iron under the contract? There can be no doubt upon that question in our opinion; and in our opinion the principle of law governing that case governs the case before us, where the debtor undertook without right to impose upon a payment of what was admittedly due a void condition that it be received in full discharge of what was in dispute."

You will see, therefore, that the decision as to your first question, whether you can sue for the balance due, depends upon the fact, whether the $75 received by you was received in payment of the undisputed part of your claim or whether every item of your bill was disputed, and you made a settlement of the dispute and agreed that only $75 was due. If the latter was the case, you cannot now claim that the debtor still owes you more than $75. You say that you did not admit that your bill was wrong; so it would seem, in your state, that you can now sue for the balance due you.

Another question which sometimes arises in such cases is whether in the matter of contracts which make no express provision as to payment of interest, the payment of the principal without interest and a receipt in full, bars any claim for interest. It is held in such cases that a receipt in full, upon the payment of the principal without interest, is a discharge of the entire debt, including interest, because it is ruled that the interest is no part of the debt but is a mere incident to it.

In the absence of an agreement between the parties that it is to be accepted as payment, the common law rule, which prevails in England and has been adopted without question in nearly all the states in this country, is that a draft or bill of exchange, acceptance, order or promissory note of the debtor is not payment or an extinguishment of the original demand. In Indiana, Massachusetts and Vermont, however, the rule is that the taking of a bill of exchange, check or promissory note governed by the law merchant, by the creditor from his debtor, for an existing debt, is a payment of the debt unless it is otherwise agreed by the parties, the presumption being that the debt is thereby paid, and the burden of proving a contrary agreement is upon the creditor. This latter rule means that, if you take a check or note in payment of a bill, you must thereafter sue on the check or note, and not on your original claim, if the check or note is not paid in the usual course. In your case it would seem to make no difference, but in some cases it would.

The dividing line in cases like yours is a rather hazy one, and you should always keep in mind the distinction between cases where there is no dispute of the debt, and a receipt is given in full when part payment is made, and those where there is a dispute of the whole claim and a part payment is considered as wiping out the entire claim, if the creditor so agrees at the time of payment.

QUESTIONS & ANSWERS

A TWO-ROOM STEAM HEATING SYSTEM.

Editor "Domestic Engineering":—I wish to heat two large rooms on the first floor of a building not otherwise heated. The owners want steam heat. The rooms are located at the front of the building on either side of an entrance hall, and the exposure is all in front. There is no cellar under the building, but there is a space of probably two to three feet between the lower side of the floor joists and the ground. The boiler will set in a cement pit, which will be constructed for it. I figure that four large 100 sq. ft. radiators will heat the rooms and enclose you a drawing showing the way I propose to pipe the job. No return pipes and radiators fed by 1½-inch connections. Please let me know if the job will work all right, as I have it planned.

Indiana. V. J. L.

Fig. 1 shows the sketch submitted by correspondent as nearly as we can interpret it. The mains extend in either direction from the boiler—one 16 ft. and the other 12 ft.—to the risers supplying the radiators. The mains pitch upward from the boiler at a considerable angle and are connected to the risers out of boiler and also to the risers to radiators by swing joints.

The sizes of pipes shown are very good, but we do not like the bullhead connection at the top of the risers, nor the manner of supplying the radiators with horizontal branches. When mains are installed without returns and pitch upward from the boiler, the connections at the boiler should be made

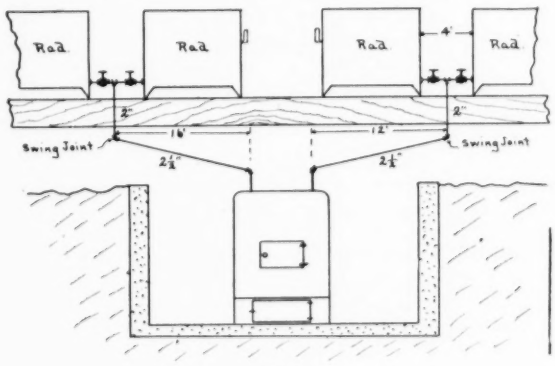

Fig. 1.

in such a manner that the condensation will enter the return of the boiler and not drain back into the steam dome, as shown by correspondent.

We submit a sketch, Fig. 2, illustrating one-half of the installation or one main and connections, which will show the proper method of making the pipe connections for a job of this kind. Note that the return connection at the boiler acts as a heel drip to the main and also as an equalizing pipe to steady the water line under conditions of quick or heavy firing.

The main, supplying the other two radiators, should be connected in a similar manner. The mains should pitch upward from the boiler about 12 inches in each 10 ft. of length.

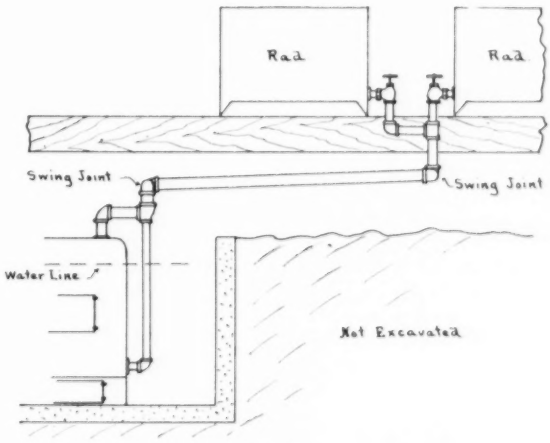

Fig. 2.

We prefer a circuit job or a job with a separate return, although the system as illustrated by Fig. 2 will work perfectly.

TROUBLED WITH A NOISY RADIATOR.

Editor "Domestic Engineering":—I am having trouble with a radiator, which fills with water and makes a rumbling or gurgling noise, and often the piping cracks and pounds.

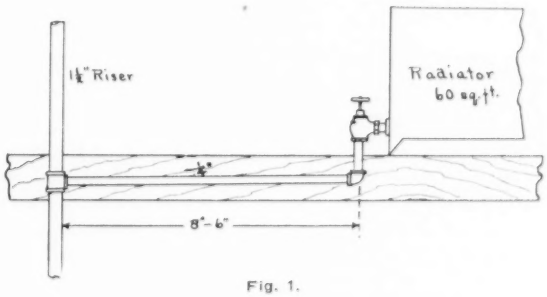

Fig. 1.

The radiator is located on the third floor of a four-story apartment building and is fed by a branch from a riser which is 2 inches in size to the second floor and 1½ inches to the third and fourth floors. The radiator which gives trouble is located 8 ft. 6 inches from the riser. It is not possible to run a riser nearer to the radiator. The branch has a very slight pitch upward from the riser to the radiator, possibly 1 inch, and although the joists run in the same direction as the branch, there are obstructions which prevent my giving the branch a greater pitch. I enclose a sketch of

the piping, showing how the radiator is connected. The system is one-pipe, low pressure steam. Please advise how I can overcome the trouble.

Pennsylvania. L. C. N.

Correspondent's sketch, shown as Fig. 1, gives some details not mentioned in his letter. A radiator having 60 sq. ft. of surface is located 8 ft. 6 inches from the riser and is supplied

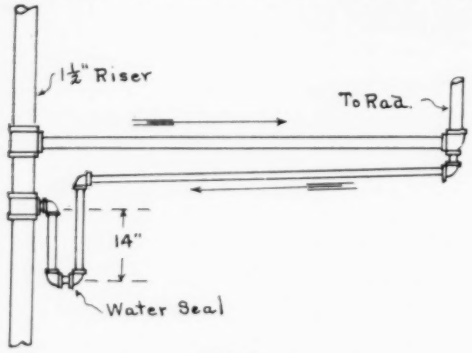

Fig. 2.

by a 1¼-inch branch. If the connection is to remain as shown, the branch should be 1½-inch in size and should have a pitch of from four to six inches from riser to the radiator connection. A reducing elbow 1½ x 1¼-inch at the end of the branch will reduce the radiator connection to 1¼-inch. To secure the proper pitch without cutting crooked threads on the pipe, a swing joint should be used at each end of the branch.

On one-pipe steam work the velocity through the branch should be as low as possible, in order that the steam passing through the pipe will not push the condensation ahead of it to the radiator, and for this reason a branch is usually made one pipe size larger than the radiator connection.

When the steam first enters a cold radiator, the condensation is rapid and water collects quickly at the bottom of the radiator. This occurs whenever a pressure is raised in the system and the water, endeavoring to return through the pipe connection to the radiator, is held at the end of the

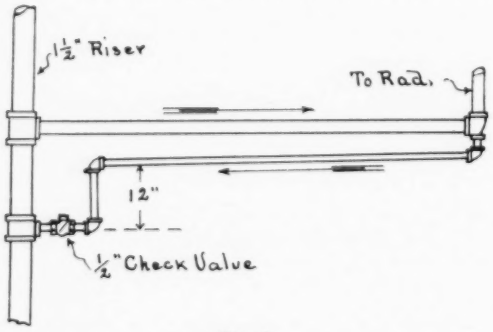

Fig. 3.

branch by the pressure of the steam. As the steam fights its way to the radiator through the water-logged pipe, the surging and pounding occur.

There are several ways of returning the condensation from the radiator to the riser without interference from the steam. Fig. 2 shows a bleeder connection with a water seal at the riser. This connection may be ½-inch throughout. Another method is illustrated by Fig. 3, and we prefer this method to that shown by Fig. 2. The bleeder should be ¾-inch in size, as far as the horizontal pipe connecting with the riser. This is made ½-inch, and a ½-inch light weight swing check valve is placed in the connection as shown. A check valve for this purpose should have a very light weight clapper, which stands in an almost vertical position when the valve is closed, so that a very slight weight of water will open it. This particular radiator may be connected two-pipe, and in this even the return is connected to the riser as shown by Fig. 2 or Fig. 3.

THE PROPER SIZE OF HEATER TO HEAT WATER IN 450 GALLON STORAGE TANK.

Editor "Domestic Engineering":—Can you give a simple rule for determining the size of hot water heater required for heating water in a storage tank? I find such a wide variation in the ratings, as given by manufacturers, that I should like to be able to determine or figure their capacities myself. As an example, please advise what size of a heater is required to heat the water in a 450 gallon tank hourly from 60 to 120 degrees?

Iowa. F. N. D.

The size of heater required for this or any similar work will depend upon several conditions. The rate of combustion maintained in the heater and the size of the tank as related to the hourly capacity are important factors in determining requirements.

Nearly all tank heaters are overrated. Tank heater ratings, as published by the manufacturers, will show that a heater having a grate ranging from 18 inches to 24 inches in diameter will be required for a tank of 400 or 450 gallons capacity, when as a matter of fact, if 450 gallons of hot water are the hourly requirements, a larger heater will be required. The fact that the heat is being stored in the tank at night and at intervals during the day, thus reducing the demands upon the heater, is responsible for the overrating. If the tank has a capacity two or three times the maximum hourly requirement, it may be safe to accept the ratings given, otherwise the actual B. t. u. requirements should be ascertained in order to safely determine the size of a heater necessary for the work. As already suggested, the rate of combustion will govern the size of heater selected. A slow rate of combustion in a small heater can be estimated at 3 pounds per sq. ft. of grate per hour. For larger heaters—those having a grate 20 inches or more in diameter—the rate of combustion may be increased to 4, 5 or 6 pounds per sq. ft. of grate per hour.

Assuming that correspondent desires to heat 450 gallons of water per hour—without storage allowance—from 60 to 120 degrees, the size of heater required may be determined as follows: :

120°—60°=60 degrees, the temperature range.

450×8⅓ (pounds in a gallon)=3,750 pounds to be heated.

3,750×60 (60° temperature range)=225,000 B. t. u. required.

Assuming that 8,000 B. t. u. per pound of coal is available (a fair average) and that a combustion rate of 3 pounds of coal per square foot of grate per hour is maintained:

8,000×3=24,000.

225,000÷24,000=9.37 sq. ft. of grate required.

If a 5-pound rate of combustion is maintained, a much smaller heater will suffice, thus:

8,000×5=40,000.

225,000÷40,000=(approximately) 5.6 sq. ft. of grate, which in a round boiler would be a grate about 32 inches in diameter.

MOVIE ADVERTISING THAT GETS *the* FARMER BUSINESS

By Ernest A. Dench, Author of "Advertising by Motion Pictures"

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THE automobile has done much to make living on the farm more enjoyable. It cannot bring the movies to the farm, but it can bring the farmer and his family to the movies. The plumbing and heating contractor, who seeks his share of the farmer business, should not leave the movies out of his consideration. The movies occupy a more prominent position in small town social life, because there is little or no vaudeville or stock company competition. Anyway, people prefer the movies, because they know films are the same as those shown on New York's Broadway. This is more than can be said of cheap vaudeville.

The community may be too small to support a seven days a week motion picture show, yet it is certain to boast a twice or thrice weekly movie. The farmer generally manages to get up to town at least once a week.

Which Medium Shall You Employ?

We will suppose there is only one movie in your town. This eliminates the necessity for selecting the most suitable theater. Shall the plumbing and heating contractor use the slide, film or theater program? Of course, for timely announcements where expense is a consideration, the slide is best. But an occasional movie film, to put across a longer advertising message in a sugar-coated pill form, would be well worth the few dollars expended on it. The program gets into the local homes and farms, even though something may prevent a person from attending the shows announced. Rest assured that it is read from cover to cover. However, if the plumbing and heating contractor is limited to one medium, I would recommend the program because your advertisement will be seen by many more people than the slide or film will reach. In some communities one medium is better than another, so it may be advisable to experiment with all three on a modest scale, and discover which is the most paying kind of publicity for your business.

Movie-izing Your Rest Room.

The plumbing and heating contractor in a rural community can make his movie advertising far more profitable and less expensive by cultivating the little considerations that count with farmer folk interested in the movies. There is his rest room, for instance. The tired farmer's wife or daughter, after a morning's shopping, has an hour or so to spend before the afternoon movie show is scheduled to commence. She picks up the magazines on the table. Not one of them deals with the movies. She is disappointed, as she would like to know more about the picture than the program contained. Perhaps she wants to read the story of the play.

When you are ordering your month's supply of magazines and periodicals for your reading table, see that you have at least one motion picture magazine.

The Special Movie Show.

Having fewer opportunities to see motion pictures, farmer folks appreciate every opportunity they get. They are not so fastidious in their tastes as city people, and while the average industrial reel is tolerantly regarded by the big city audience as a "filler", farmer folk receive the industrial film almost as enthusiastically, as if it were the feature photoplay. Another reason for this is that rural folks find information imparted by the motion picture route exceedingly easy to grasp.

The Bureau of Commercial Economics, Washington, D. C., has several hundred educational and industrial reels, which it is prepared to loan free of charge. There are reels on practically every available subject. The stipulations for service are as follows:

"1. Payment of transportation charges from and to the distributing center.

"2. A report of films used and attendance shall be mailed after each performance to the distributing center.

"3. The films shall be used on standard motion picture projectors, handled by competent operators.

"4. Films shall be returned immediately after use.

"5. No fee whatsoever is charged or accepted for the use of the films of the Bureau.

"6. No admission fees to the public are permitted to be charged nor are collections, during or after the exhibition, permissible. Application for the service must be made on the application blank."

In filling out the application blank, which may be obtained from Washington, you have to promise to show the reels under the rules and regulations stated previously. You then state the size of auditorium, type of projector-focal throw, how often films are required and the type of audience.

Select from the list of available films several reels dealing with farm sanitation and comfort. Then go to the local movie exhibitor, tell him that you wish his theater some morning or afternoon for a special performance, the show to comprise several industrial and educational reels and two or three good, short comedies and dramas. He can rent the latter for from $5 to $10 from his film exchange. Get an inclusive estimate for renting his theater, the operator's services, and the comedy and dramatic reels. He should quote you from $10 to $20, depending, of course, on the size of his theater and the age of the photoplays rented.

After all arrangements have been made, send to all farmers on your mailing list a circular letter calling attention to the motion picture performance you have arranged and inclosing two tickets for the same. This stunt would even be more effective at a time when business is dull. At the end of the performance screen a slide to the effect that a visit to your store is now in order. Many of the spectators will act on the suggestion after having a good time at your expense and being impressed by the industrial reels.

If the performance proves too costly for the plumbing and heating contractor to operate it by himself, no doubt other local merchants would like to come in on the scheme.

SCENERY

The Story of the Master Plumber, Who Needed a Change of Scenery—How He Got It, and the Effect It Had on His Business

By William Robert Marshall

I KNOW one of the best men on earth, a good, big-hearted, lovable chap, capable, fairly well-to-do, fine home, nice family—but, well, allow me to say, what I was going to say about him, quoting his own remark, which he made to me one day about a year ago.

I called to see him about an advertising scheme, which I had every reason to believe would prove interesting to him, but to my surprise it didn't ruffle the serenity of his indifference.

"Arthur, old top, what's the matter with you? Here's a chance for you to make some real money, and you don't even say hello to it?" I asked in surprise at his attitude.

"Pot-bound, Bill, old man, Pot-bound," he replied languidly.

"What do you mean—'pot-bound'?" I insisted, as I perceived that he was not attempting to appear facetious.

"I'll tell you, what's the matter with me," he replied, "by telling you what I found last Sunday when I repotted a once beautiful flower. About a year ago, as a surprise to my wife, I bought this beautiful plant, potted in an imported wooden tub, and had it sent out to our home. It appeared to flourish in its new environment, until about a month ago we imagined it was sulking a bit, and last Sunday my wife said: 'Arthur, why don't you re-pot that plant? I believe it needs new earth.'

"So I took it out in the back yard, had quite a tussle with it, it weighs, tub and all, about one hundred pounds, and I carefully removed the earth all around the inside edges of the tub, and then tipped it over on one side and pulled the plant out of the tub.

"I was determined to make a good job of it, while I was at it, so I carefully removed all the old dirt from around the roots. And man alive, you ought to have seen those roots, there were a mass of them, all curled and twisted, interwoven, until I despaired of getting it all cleaned, but I finally managed, and then to get an idea of the amount of new dirt I would have to get, I tried to fit the plant back into the tub and do you know that that mass of roots actually filled that tub?

"Yes siree, it did. There wasn't space enough left to make it worth while. And while I was sitting on the ground, studying about what I was going to do—get a bigger tub or cut off some of the roots or plant it out in the yard—I discovered what the matter had been with the plant." He paused, lit a cigarette and waited for my: "Well?"

"It was pot-bound. It had been growing, growing until its roots had reached the sides of the tub, and then, being thwarted in its attempt to expand, had reversed its intention and doubled back, until it began to choke itself to death, and naturally it began to lose interest in life and was just living, that's all, just living. And that's what's the matter with me. I am pot-bound, sitting in this office year after year, and year after year. Do you wonder I am not interested? I am pot-bound. I need a new tub, or else I ought to get out and find a fresh piece of ground in which I can expand a bit."

Now I ask you candidly, is there any use of arguing with a man who knows he is pot-bound and then continues to allow himself to be strangled to death?

I went away from that place with a mist of gloom all over me, and I didn't get rid of it until that afternoon, when I called on a friend of mine in the office furniture business.

"Say Ted!" I began, knowing that he and my friend were good friends. "Old Art Spooner seems to have lost his grip, doesn't he?"

My friend Ted laughed. "Old Artie needs some new office furniture, he needs to change the scenery a whole lot, before he can look at the world with a Twentieth Century viewpoint. He has had that collection of junk up in his office ever since he went into business and, furthermore, he bought it second-hand, when he did buy it."

"He says he is pot-bound," I offered in defense of our friend, and then I told Ted the story of the pot-bound plant.

Ted thought for a few minutes before he replied: "Say old kid, that's a bully idea for a campaign of propaganda, the reason business men should change the scenery in their office once in a while."

"You're heartless," I chaffed him and went my way.

Just another reference to Arthur Spooner! Two months ago he went away on a vacation, the doctors said it was absolutely necessary, and a new man came in as manager.

The new manager didn't buy any new office furniture. Old Art wouldn't stand for that, but he did have the place cleaned out and painted, and he *changed the location of every desk and chair* in that office, moved the old desks back against the walls and put a table in the middle of the room with chairs around it, and, man, the place doesn't only look different, but the business looks different.

Now, then, I have another friend out in Pico Street—a plumber friend, who has an elegant location and a fair business, he says he doesn't want any more than he gets, but he lies, as most men do, when they make that kind of remarks in reply to the question "How's business,"—who has been sitting behind an old roll top desk of the vintage of '79 for the past ten years. His office and store, and, mind you, he is located on a business thoroughfare, have never been shifted to my knowledge for five years.

Shortly after my run-in with Art and my run-out with Ted, I called to see old wise-acre Charlie Roclair, the plumber, and he was grumbling about being so d—d sick of coming down to that old office every day, day in and

day out, that he thought he would retire—didn't need to work any more anyway. He was getting old and stale just sitting around, etc., etc., etc.

And I told him the story of the pot-bound plant, and what the new man had done by changing the scenery.

"And I suppose, if I change the office around and put my desk over there in the dark, and these lavatories over here in the light, and buy a few chairs and put a 'Winged Victory' on a pedestal in the window, and serve tea at four o'clock, that business will come streaming in the door, and I will be happy ever afterwards," he grunted and he snorted.

But I was sure Charlie Roclair was getting pot-bound at

"I'll tell you What's the Matter with me," he replied.

that, so I called my friend Ted, the office furniture man, by 'phone and tipped him off to a possible chance to do some scenery changing in Charlie's office.

"I know that old bird," Ted replied, "we belong to the same lodge. He wouldn't spend $10 for a bank president's suite."

"Go get him, you slacker," I dared him, and then made it worth while by offering to bet him a hat he couldn't do it.

About two weeks ago he called me by 'phone. "Seen Charlie Roclair's new office and store?" he asked.

"No. What do you mean *new office and store*, trying to kid me about having to buy me a new spring hat?"

"I got him about a week ago, traded him a new outfit for some plumbing, a new bath out to the house. Go take a look, and then send over that hat order," and he hung up the receiver.

I just came back from Charlie's. He's got a new store and office all right, but he's got something more. He's got a new suit of clothes and a new hat, and he wants to know how much it costs to advertise "Good Plumbing" in the newspapers. *He's got a new viewpoint.*

* * *

Moral: If you are down in the dumps—business rotten—everything gone to pot, and you are becoming pot-bound, try changing the scenery.

The United States Council of National Defense Says:

Buy Only What You Need—But Buy It Now.

The re-employment of returning soldiers, sailors and marines is the patriotic duty of the whole people.

Industry cannot absorb these men and take care of men already employed, unless there is a demand for industrial products.

All commerce rests finally upon the individual purchases of the people.

When people buy, business is good, when people cease buying, business slackens.

The nation is in a period of transition from a war to a peace basis—to make this transition quickly, it is necessary that the people of the United States understand the necessity of *buying what they need now.*

Hoarding is dangerous, so is waste.

Take the middle course.

Buy now, but buy carefully.

New York, N. Y.—The Austin Heating Corporation, of 121 West Forty-second Street, has secured the contract to install the heating system in the barracks being erected at Bath, N. Y., for the State Soldiers' and Sailors' Home. The contract amounts to $7,575.

SPEEDING UP THE TURNOVERS.

By Robert Falconer.

AT infrequent intervals wooden dams were thrown across a mountain stream to furnish power for a few saw mills. The total power and the total wealth developed by this stream were very small in comparison with its latent capacity. An engineer surveyed the stream. He built masonry dams close together throughout its entire length. He transformed the water power into electricity, transmitted it to the near-by cities and made a huge fortune. In both cases the river was the same. Its capacity for producing wealth was the same. But the engineer made the river do more work. He increased the number of water wheels it drove. He speeded up the turnovers.

A man buys a business. He turns his stock once or twice a year. Business is good but he makes no money. Bills due pile up. His creditors become impatient. He is driven into bankruptcy and is forced out of business. Another man takes over the business. He turns the stock eight times a year. His profits keep increasing. Each year he has a large balance for outside investments. In a few years he becomes one of the wealthiest men in the city. In both cases the possibilities were the same. All the second man did was to make his capital work harder, to make it produce more wealth for him. He speeded up the turnovers.

In a small New Hampshire city there lived an erratic old fellow who kept a little store. One day a lady entered and asked for a can of tomatoes. He told her that he had one can left, but had rather not sell it. He desired to keep a good variety in stock, and if she could wait he would get her a can of tomatoes later. This man never made more than barely enough money to exist upon. He wore cheap clothes, lived in the back room of the store and had no more than enough to eat. He was keeping a store, not running a business. He kept his goods rather than sold them. He was not speeding up his turnovers.

Money Must Be Made to Work.

Money, like rivers, must be made to work to its utmost, if it is to produce the greatest possible wealth. It cannot be allowed to lie idle in stock that does not move. It cannot be allowed to become stagnant in goods stored in dusty, cobwebby warehouses. It must be kept constantly on the move. It must work continuously. No sooner should it be invested in one lot of goods than steps are taken to invest it in another lot of goods. It's not the amount of capital a man uses in his business as much as how hard he makes that capital work for him that determines the amount of money he will make. It is not the amount of money used, but the way in which it is used that counts. Annual profits depend upon the success with which the business man has been speeding up his turnovers.

New merchandise is a profit maker. Old merchandise is poison. It not only eats up the profits but the capital as well. It is a poison that soon permeates the whole business system. Unless it is eradicated, it will eventually kill the business. The strong, healthy business has no old, shopworn merchandise eating on its vitals. It has fresh, new merchandise constantly flowing through it from the producer to the consumer. Storing goods is fraught with danger. Selling goods leads on to success and wealth. Every business man has much to gain in the revitalizing of his business which will result from speeding up the turnovers.

Not Capital, But An Active Business Needed.

It's not capital that business men need to increase their profits. It's a vitalized, active business. Some tiny city stores never carry enough stock to last them more than three or four days. The owners of these stores are making money. Practically the total capital invested is in fixtures, in overhead that is necessary to carry on the business. These men never fail. They always make money. They have no capital tied up in dead stock that is sapping the life out of the business. They need fear no competition. Their positions are impregnable because they are speeding up the turnovers.

A dollar invested ten times a year brings in more net profits than ten dollars invested but once. One dozen each of six different items will sell six times as many as six dozen of one item. Six profits instead of one. The thinner you can spread your capital and still meet the demands of your trade, the greater the profits you will make. The thicker you spread it, the greater the quantity of single items that you buy, the smaller will be your profits. Every dollar more than is absolutely necessary that is invested in any one line of goods not only reduces the profits by just that much but also clogs up the business machinery and prepares the way for the sheriff and his red flag. There is but one way to guard against this. There is but one safe course to pursue. That course is to speed up the turnovers.

Bury Your Money in the Back Yard.

If you must bury your money, bury it in the back yard, where you can dig it up again. Don't bury it in idle stock, where changes in value will probably prevent you ever getting it back again. Idle stock transmutes your money into dross. Active stock transmutes credit into pure gold. Keep on the active side of the line and you become rich. Fall back to the stagnant side and you die in the alms house. There is only one safe and sure way of maintaining your position on the profit side of the ledger. That way is by speeding up the turnovers.

BUILD SCHOOL HOUSES!

"Build school houses," says Dr. P. P. Claxton, United States Commissioner of Education.

"Previous to our entrance into the war we were spending in the United States a hundred million dollars a year on new school houses, but at this rate we were in no wise supplying the need. Hundreds of thousands of children in the lower grades were on half-time attendance, and millions attended schools in houses wholly unsuited to school use, according to modern standards—badly ventilated, poorly lighted, and otherwise unsanitary.

"For the two years of our participation in the war school house building almost ceased, and there are now both the need of 1916 and the accumulated need of the two years of the war, larger than in normal times because of the unprecedented shifting of population.

"To supply these needs will require not less than five hundred million dollars of buildings, to be completed by the time of the opening of the schools in the fall of 1920. It is very important, therefore, that legislatures, county and city councils, and boards of education all over the United States immediately take the necessary steps for this building and for the raising of money necessary for it.

"In view of the part which popular education must play in the new era there can be little or no objection to any expenditures for buildings that may be necessary for the full efficiency of our school systems."

Tyrone, Pa.—The Tyrone Plumbing & Heating Co. has secured the contract to install the plumbing in the $55,000 addition to the Armory.

New York, N. Y.—Child & Scott, of 112 Wooster Street, have been awarded the contract to install the heating system in a $75,000 church on 112th Street.

MASSACHUSETTS MASTER PLUMBERS *in* SUCCESSFUL *and* PROFITABLE CONVENTION

Bay State Craftsmen in Two-Day Convention at Boston Discuss Vital Trade Problems — Wm. H. Sullivan Elected President

THE Massachusetts State Association of Master Plumbers held its annual convention in Boston on Tuesday and Wednesday, April 1st and 2nd, with an exceptionally large attendance.

It was Massachusetts' first attempt at a two-day convention, but the delegates found little difficulty in filling the time without resorting to sightseeing tours. The meeting was held at the New American House, the scene of the annual state conventions for many years past. Delegates began to arrive from more distant sections of the state early in the day and there was a good attendance at the Tuesday afternoon session, although not so large as on the following day.

Arrangements for the meeting were in charge of J. Preston Perham and Edwin W. Cox, of Boston, and G. Wilbur Thompson, of Newton, and they with President Daniel F. Carroll, of Lowell, and Secretary James H. Trow, of Salem, were on hand early to welcome the delegates.

Opening Session.

The first day of the convention was devoted entirely to routine matters. Although the meeting had been set for 2 o'clock, it was considerably later before committee meetings were concluded and other preliminary matters so arranged that the convention could get down to business.

Appointment of Committees.

One of the first acts of President Daniel F. Carroll was to name P. A. Lang, of East Boston, to his annual position as sergeant-at-arms. Elwood B. Noyes, of Salem; H. S. Bond, of Hyannis, and George H. Powers, of Gloucester, were then named as a committee on credentials; and Andrew J. Curtin, of Medford; Charles H. Smith, of Boston, and G. Wilbur Thompson, of Newton, as auditing committee. The latter committee, with the exception of Mr. Curtin, who was kept home because of illness, retired and audited the books of the treasurer and later reported that they found them in satisfactory condition, with all expenditures properly vouched for.

Secretary James H. Trow, of Salem, reported a total membership in the association of 461, of whom 14 had been added during the year. He declared the association to be in a prosperous condition, with prospects of a good year ahead. Treasurer J. Preston Perham, of Boston, reported a cash balance on hand of $969.

The Sanitary Committee's Report.

The report of the sanitary committee, composed of H. S. Bond, chairman; L. E. Andrews, W. H. Todd, W. B. Wolcott and W. L. Bacon, was presented by Chairman Bond. The report was in two parts, the first prepared by Mr. Wolcott, and the last by Mr. Bond and other members of the committee. Mr. Wolcott submitted an interesting history of the bath tub. He also urged united action by the master plumbers toward a higher degree of efficiency. "I think," said Mr. Wolcott, "that we should strive for higher standards, and in order to bring this about let us have in mind a uniform plumbing law throughout the state, easy for inspectors to interpret, covering all vital points on sanitation, and standardizing the material to be used. For example, plain soil pipe is used in one city and in the one adjoining tarred pipe is required. This forces the jobber and also the master plumber to carry a much larger supply of material. Since the beginning of the war, efficiency has been the slogan, and the foregoing is not in harmony."

Continuing, the report urged that plumbers in various sections of the state follow the example set by some of the smaller associations and discourage the habit of borrowing from one another. "While this does not pertain strictly to sanitary matters," Mr. Bond said, "it is a reform, which I hope will become more general. Most every plumber is perfectly willing to help out another associate with some special fitting or stock, but you will necessarily have to take his time, which is a loss to him, and oftentimes the thing returned may be of a different pattern or make, which makes further trouble. We have made it a rule in our section that whenever we need to borrow anything we pay the regular retail prices for it, which somewhat repays those who accommodate us and reimburses them for their time. We have found that this promotes a better feeling and discourages extensive borrowing, while at the same time it gives needed assistance. We would not go back to the old rule of borrowing and returning.

"Another matter, which demands attention, is the discouraging of the use of chemical closets which are being used quite extensively in many of the suburban districts and which are most unsanitary. It would be beneficial, if plumbers would encourage the use of the self-flushing closets or outfits that can be flushed satisfactorily with the elbow, foot or otherwise than with the hand. It would tend to decrease the spread of disease by careless persons.

"We believe that the piping in the houses and the setting up and connecting of boilers, etc., should come under the inspection laws as a safeguard to the plumbing trade, to keep out much of the unskilled construction and dangerous installations.

"As we sow, so shall we reap, and the plumber, who adheres strictly to the rules of sanitation, as laid down by the laws of the state, will leave nothing but satisfaction behind him."

Good Essays by W. B. Skinner and R. E. Dockham.

Two excellent essays also were presented at the Tuesday session, one by W. B. Skinner, of East Braintree, and the other by Reuben E. Dockham, of Salem. Mr. Skinner devoted himself mainly to trade topics, while Mr. Dockham

preached "Courage and Optimism," declaring that the days ahead call for "big men."

"The two problems which confront the master plumber today," said Mr. Skinner in his essay, "are, first, the high cost of material; and second, copper pressure boilers. On the first it seems to me the manufacturers and jobbers ought to get together and set the price of cast iron goods at a figure low enough to gain the confidence of the public. The sooner this is done, the quicker people will start to build. The writer has figured several small houses, and when figures were submitted, customers would say they would wait until material was cheaper. If material is not to be any lower, it seems to me the quicker the public knows it the better. As a great many people have made money out of war work, and some have been able to hang onto it, they would undoubtedly loosen up, and give us a share of it, if we could get their confidence.

"The subject of copper pressure boilers has been brought to your attention several times in the last three or four years. If courts are going to hold us financially responsible for accidents from these boilers, it seems to me that we should fully investigate this matter from every point of view. If our boilers, under our state laws, are no better, or little better than before, there must be some other cause of the explosions which are frequently occurring. In installing pressure systems, it seems to me that we should be careful in size of stove and water front we connect onto or stop using pressure boilers.

"If your customer insists on a pressure boiler, make him sign a release from any damage from the same. We all know that when water is heated to 250 degrees or more, it will, if released, turn into gas or steam and will increase in volume 1700 times. The writer firmly believes that the explosion of copper boilers is more often caused by overheating than by excess pressure, and if the courts are going to hold us responsible, it seems to me that the only way for us is to refuse to install pressure boilers or to make customers sign a release for any damage resulting from overheating."

The Annual Banquet.

The annual banquet, held on Tuesday evening at the same hotel where the business sessions took place, was a "stag party," even to the entertainers, and in a measure was but a continuance of the business sessions in that trade subjects were the principal topics of discussion. The dining hall was simply decorated, two large American flags and the seal of the State of Massachusetts behind the speakers' table being all the decorations in the room. President Carroll was toastmaster, and gathered about him at the head table were: James S. Cassedy, director of the National Association; former State President William A. Bradford, of Quincy; Secretary Trow; Treasurer Perham; Frank W. Hubbard, of the W. B. Hubbard & Sons Co.; H. A. Lyons, publicity manager of the First National Bank of Boston; Professor Charles W. Killam, head of the school of architecture at Harvard University; the Rev. Father John G. O'Brien, of Sharon; J. E. Slattery, of Crane Co.; W. H. Sullivan, of Fall River, and R. V. Worthen, of Leominster.

Between courses the company, which numbered nearly 100, joined in singing war songs, led by a male orchestra.

The first speaker introduced by President Carroll was Mr. Lyons, who told of business conditions in all lines, as his company has found them. The high cost of materials and labor, the tightness of the money market, due to the approaching Liberty Loan, the delay in the signing of the peace treaty—all these things, Mr. Lyons believed, had contributed to the unsettled business conditions evident throughout the country. The recent reduction in steel prices, he said, had brought little new business. Labor costs, he declared, must go down and must start in the near future; labor must be willing to accept some reduction, and capital as well, or the country will be flooded with foreign made goods. How much the question of women in industry would affect business conditions, Mr. Lyons was not prepared to say. Mr. Lyons believed Europe, especially Russia, and South America, offered big fields for the plumbing supply dealers. "They are just waking up to what sanitation means in those countries," he said. "Until they went into the army, thousands of Russian peasants had never seen a shower bath. Now they have grown used to them, and they will demand better things in their homes."

Professor Killam followed, giving a brief outline of how architecture is taught at Harvard University. The plumbing end, he said, was covered in five lectures, which were admittedly inadequate for so big a subject. The lectures cover fixtures, hot and cold water systems, traps, drains, and sewage disposal. It was difficult, he said, to know just what should be taught a prospective architect about plumbing. He did not think it was necessary that an architect should go into a shop and study plumbing any more than he should learn carpentering or any other of the many trades, which are concerned with the construction of houses, and he was anxious, he said, to get the opinion of the master plumbers as to how much an architect need know of the business. Professor Killam expressed the opinion that there were too many different laws regarding plumbing. They should be standardized, he said, for water ran through pipes the same in the Berkshires in western Massachusetts as it did in Boston. People would have more confidence in plumbers, he said, if the laws in different sections did not differ so greatly.

Father O'Brien, who followed Professor Killam, delivered an eloquent patriotic address, and then Mr. Hubbard was called upon for a brief discussion of trade conditions. He declared the most essential thing was this, that everyone, dealer or master plumber, should be an optimist. Price adjustments, he said, were coming gradually, and he believed the jobbers were prepared to give the master plumbers reductions as soon they were available, and with just as much alacrity as they raised prices during the past few years. He said material cuts already had come in enameled ware, soil pipe, steel pipe and in some other lines. He felt that in many lines, in which there had been reductions recently, the present basis would be maintained for some few months.

James S. Cassedy, who was present as the official representative of the National Association, was the closing speaker. His remarks were in the nature of a reply to Professor Killam, and he expressed regret that the professor had not been able to remain to hear what he had to say. He said that it was true that plumbing laws differed, but, he declared, this was not the fault of the master plumber. All laws on various subjects differed, he said, pointing to the vast variance in divorce laws in different states, and giving other instances. He thought the colleges and schools should long ago have come to the master plumbers to find out about the plumbing business, before they began teaching on the subject. The master plumber was as keen a business man, as was to be found in any line, Mr. Cassedy asserted. His business brought him in intimate contact with all classes of people—today he was in a ditch side by side with the trench digger, tomorrow he was sitting in the parlor of the millionaire, discussing a contract. He meets all classes. Any one of the 600 members, Mr. Cassedy said, can tell Professor Killam what he ought to teach in his school, if he will only give us a chance.

Referring to present business conditions Mr. Cassedy de-

clared that labor cost was just as much an economic question as was the price of pipe or fittings, and that labor costs, like other costs, must come down, for war prices could not be maintained under peace-time conditions. Everyone should pull together to get prices down to the point where people will build and create business for the master plumber.

Wednesday Morning Session.

Manufacturers of range boilers, jobbers, salesmen and all master plumbers, whether members of the association or not, were invited to be present at the Wednesday morning session of the convention, which was devoted exclusively to a discussion of boilers, causes of explosions, and means of overcoming such dangers. The session was so largely attended that it was necessary to hold it in the main dining room of the hotel, and the subject proved so interesting that the discussion was continued after luncheon and well into the afternoon.

Edward C. Kelley, of Boston, a member of the association and formerly secretary of the state board of examiners of plumbers, who as a result of an explosion of a boiler installed by him, had been led to make an exhaustive study of the subject, was the chief speaker. Private Edward C. Kelley, Jr., recently released from army service, also spoke, his talk having much to do with the technical end. Mr. Kelley, Sr., declared that in his opinion the trouble was not so much with the boilers themselves as with the abuse of the boilers. Some explosions, he said, were due to high temperatures and others to high pressure. He discussed several styles of valves, some made to control temperature and others to control pressure, and submitted a number of samples and explained their working. The younger Kelley demonstrated how heat weakens copper, discussed the relative strength of copper, wrought iron and steel boilers and spoke of the importance of temperature regulation, particularly since gas water heaters had become so common. In concluding his talk he made five suggestions:

First: That a safety valve be installed in the head of all boilers.

Second: That a vacuum valve be installed in all boilers.

Third: That the use of coils in fire boxes be prohibited.

Fourth: That temperature control valves with fusible plugs be installed.

Fifth: That in large heaters a thermostat be installed on the jacket to control the energy.

Members of the association and others present were invited to ask questions, and a number of them availed themselves of the privilege, the Kelleys, both father and son, doing their best to answer. Private Kelley demonstrated, by means of a drop of water upon a heated surface, the power behind an explosion from overheated water turning to steam, declaring the power was greater than the explosive power of gun cotton, dynamite or other commercial explosives. The force developed by overheated water in an ordinary range boiler, he said, would be sufficient to demolish an ordinary dwelling house, and in some larger boilers sufficient to lift a battleship from the water.

One of the first acts of the convention, when the regular business routine was resumed, was to send a letter of sympathy to Andrew F. Curtin, of Medford, former president and a member of the board of directors, who is ill at his home, with influenza.

Charles W. Winslow, assistant secretary of the Springfield Chamber of Commerce, invited the association to hold its mid-summer convention in his city. His invitation was seconded by telegrams from Mayor Adams, of Springfield, and other officials and business men. The matter was referred to the board of directors.

A report on a referendum vote on the question of reducing the membership fee was made, and the convention voted to abide by it and let the fee remain at $8 for the present.

Elmer S. Stack, of the Stack Heater Co., then explained the details of a bill pending in the legislature, having to do with the testing, marking and other details in connection with the manufacture and sale of range boilers, and on motion of James S. Cassedy, national director and member of the Massachusetts association, the convention voted to endorse sections five to eleven of the bill, inclusive. It as decided that the endorsement should not work to prevent individual members, endeavoring to secure the enactment of the first four sections, which relate to the weight and strength of range boilers. Some of those present thought, however, that these sections would work a hardship, both on the manufacturer and on the public, if made a law.

President Carroll's Annual Report.

President Daniel F. Carroll, making his annual report, urged members of the Master Plumbers' Association to affiliate with the new Massachusetts Sanitary Club; that they support recently enacted plumbing laws, and that the by-laws of the association be amended so as to give each county in the state representation on the board of directors. He also recommended that the association consider the employment of a permanent secretary, who would devote his entire time to the work of the organization; that the state be divided into two sections, east and west, with the idea of holding more frequent sectional meetings, all members, however, to continue to be affiliated with the state association. He paid tribute to the work of Secretary James H. Trow and Treasurer J. Preston Perham for their efficient handling of the association affairs.

Resolutions were adopted on the death of James C. Luby, of Worcester, a member of the association for many years. Daniel Loan, David Craig and A. E. McDonald were made a committee to have them suitably engrossed.

Election of Officers.

The election of officers, which followed, resulted in the choice of:

William H. Sullivan, Fall River, president.

G. Wilbur Thompson, Newton, vice-president.

James H. Trow, Salem, secretary.

J. Preston Perham, Boston, treasurer.

R. V. Worthen, Leominster, and C. H. Smith, Boston, were elected as delegates to the national convention, with G. Wilbur Thompson, of Newton, and Edwin W. Cox, of Boston, as alternates.

The credentials committee reported a total attendance of 152 members.

James S. Cassedy, who was present, both in his capacity as a member of the association and as an official representative of National President L. McNamara, spoke briefly on the work of the National Association and outlined some of the benefits to be had from the Trade Extension campaign. David Craig, formerly National president, spoke in a similar vein and also urged master plumbers to encourage ambitious journeymen to make the most of their opportunities.

In closing, the association appropriated $50 for the purchase of a suitable memento for the retiring president, and the new president named Daniel Loan, J. Preston Perham and G. Wilbur Thompson as a committee to select it. The president announced that he would make known the personnel of his regular standing committees later.

Convention Notes.

Secretary James H. Trow looked after the welfare of the trade paper representatives in his usual manner. They

had the best there was, and as usual everything was done to assist them in getting complete reports.

The appointment of P. A. Lang, of East Boston, as sergeant-at-arms was a matter of course. If anyone else had been at the door, old timers at the convention would have felt that they were at the wrong meeting.

Many regrets were heard at President Carroll's decision not to be a candidate for re-election. President Carroll explained, however, that between his duties as a member of a busy plumbing firm, president of the Lowell Master Plumbers' Association, and president of the Massachusetts Sanitary Club, his time was pretty well taken up.

The plan of having a two-day convention, tried this year for the first time, worked out pretty well, and there appeared to be a general sentiment in favor of its continuance.

The attendance at the banquet was not so large as it had been in some former years, but in the opinion of those who attended it was the stayaways who were the losers.

The absence of Andrew F. Curtin, former state president, was noticed almost as soon as the convention was called to order. It was the first convention that "Andy" had missed in a long time and only serious illness kept him away this time.

Convention Dates

May 2 and 3, 1919.—The twenty-second annual convention of the Colorado Master Plumbers' Association, at Denver, Colo. The sessions will be held in the rooms of the Denver Master Plumbers' Association, 419 Quincy Building.

May 5, 6 and 7, 1919.—The annual convention of the Texas Master Plumbers' Association, at San Antonio, Texas.

May 9 and 10, 1919.—The annual convention of the Oregon State Association of Master Plumbers, at Astoria, Oregon.

May 13 and 14, 1919.—The annual convention of the Georgia State Association of Master Plumbers, at Columbus, Ga.

May 14, 1919.—The annual convention of the Connecticut State Association of Master Plumbers, at New Haven, Conn.

May 14 and 15, 1919.—The annual convention of the North Carolina Association of Master Plumbers, at Greensboro, N. C.

May 19 and 20, 1919.—The annual convention of the Kentucky Master Plumbers' Association, at Lexington, Ky.

May 20 and 21, 1919.—The twenty-fifth annual convention of the Pennsylvania State Association of Master Plumbers, in Williamsport, Pa.

June 12, 13 and 14, 1919.—The annual convention of the Heating & Piping Contractors' National Association, at Atlantic City, N. J., with headquarters at St. Charles Hotel.

June 16, 1919.—The annual convention of the New Jersey State Association of Master Plumbers, at Atlantic City, N. J.

June 17, 18 and 19, 1919.—The annual convention of the National Association of Master Plumbers, in Atlantic City, N. J. The headquarters of the convention will be at the Hotel Breakers.

Georgia Master Plumbers Will Meet at Columbus, Ga.

The Georgia State Association of Master Plumbers will hold its annual meeting in Columbus, Ga., on Tuesday and Wednesday, May 13th and 14th, according to the official call just issued by President H. W. Albrecht, of Columbus, and Secretary James E. Belcher, of Atlanta.

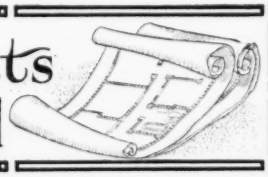
North Carolina Plumbers to Meet in Greensboro.

The North Carolina Master Plumbers' Association will hold its annual convention in Greensboro, N. C., on Wednesday and Thursday, May 14th and 15th, according to the official call, which has just been issued by Vice-President L. L. Hackney, of Charlotte.

Connecticut Master Plumbers to Meet at New Haven.

The Master Plumbers' Association of Connecticut will hold its annual meeting at New Haven, Conn., on Wednesday, May 14th. The officers of the association are planning an instructive and timely program for the meeting.

Contracts Awarded



Cleveland, O.—Robert Morlock, of 8010 Keyes Avenue, has secured the plumbing contract on a factory at 3800 East Ninety-first Street.

Philadelphia, Pa.—Wm. Newell & Son, of 1707 Sansom Street, have been awarded the plumbing contract on a $50,000 factory at Clifton Heights, Pa.

Columbus, O.—Huffman & Wolfe Co., of 669 North High Street, has been awarded the contract to install the plumbing in a $125,000 high school at West Unity, O.

Washington, D. C.—H. A. Douglass, of the Oxford Building, has secured the contract to install the heating system in a $130,000 apartment house on Belmont Avenue.

Cleveland, O.—Frank A. Warburton, of 9416 Raymond Avenue, has secured the contracts to install the heating and plumbing systems in a store and warehouse at 727 Bolivar Road.

Philadelphia, Pa.—N. Connelly, of 1905 Ridge Avenue, has secured the plumbing contract on the $215,000 drill shed and stable addition to the Armory, at Thirty-second Street and Lancaster Avenue.

Reading, Pa.—The Sharp Construction Co., of 22 North Fifth Street, has been awarded the contracts to install plumbing and heating systems in the $39,000 addition to the Armory at Rose and Walnut Streets.

Riverside, R. I.—Merriwether & Dunn have been awarded the contracts to install the heating and plumbing systems in the theater and building on Matheson Street, which is being remodeled at a cost of $50,000.

Dayton, O.—Geo. A. Kirschner has been awarded the contracts to install modern plumbing in five residences being erected in Oakwood. The heating contract went to Art E. Smith, of 1412 North Main Street.

Cleveland, O.—The Royal Plumbing Co., of 2625 East Fifty-first Street, has secured the contracts to install plumbing systems in 26 duplex houses on East 148th and 149th Streets, off Lake Shore Boulevard.

Cleveland, O.—Joseph Passov, of 10517 Morrison Avenue, has been awarded the contracts to install the plumbing in four double residences on Hopkins Avenue and five apartment buildings on Aspinwall Avenue.

EXPORT SALES QUESTIONNAIRE

A New Department to Assist Our Readers in the Vital Topic of Exports, Customs, Duties and Foreign Requirements

By John J. Laferme

John J. Laferme.

IN the preceding articles I have endeavored to show the possibilities of export sales of sanitary ware, and to sum up what I have written, so far, which may be useful, owing to its having been interspersed with arguments and personal experiences, I wish to state again the condensed facts.

There is a good demand in Europe for American-made sanitary ware.

American sanitary ware is vastly superior in patterns, finish and uniformity of product to that made in any other country.

European manufacturers recognize this superiority but, owing to the weak, inadequate, irregular efforts made by the American manufacturers, without system, advertising, consideration of requirements, the European manufacturers easily defeated the introduction of better ware, so as to be able to continue the use of their own antiquated patterns and equipment.

The best sanitary ware factories of the Continent are destroyed.

There is an immediate demand for reconstruction and current requirements at present in Europe, owing to the destruction of most factories and disorganization of the others.

The present demands can be filled by American manufacturers, with a view to establishing permanent sales and possibly interesting themselves in the reconstruction of various factories in Europe by supplying the know-how for a consideration.

The fact that the European manufacturers' antiquated plants and patterns are destroyed is positively going to cause the introduction of the recognized superior American patterns.

Only three of the numerous European nations ever produced sanitary ware.

At least 80 per cent of the ware produced in England was exported to other countries.

American manufacturers have been short-sighted in neglecting to build up foreign trade to benefit themselves as well as the country as a whole.

American sanitary ware manufacturers and many others, have not been trade-builders, but trade exploiters. They have thought too much of the present and very little about the future. This has become an almost National trait in this country.

Since writing these articles, I have been favored by many inquiries from manufacturers whom I have visited, if it was convenient, or replied to by mail, if too far away.

One visit made by me to a firm, whose management consists of three representative, very fine gentlemen, resulted in the usual decision, namely: That they were interested in selling abroad, only if the effort entailed no expense to them, no modification of patterns, the European customers to purchase and pay for their goods through a New York export house at the usual terms offered to their trade in the States, which is well acquainted with their wares. How is that for aggressiveness?

Another visit to one of the best known firms in the Middle West resulted in the desire to sell in Europe, provided it did not interfere with their relations with a local firm manufacturing a different commodity, which has a connection in England.

A conversation with the sales manager of one of the leading manufacturers in this country developed the fact that their home trade kept them busy enough.

These gentlemen are all very sincere in their statements; they believe they are doing the best for their organizations; but at that rate the United States will never succeed in gaining a footing in export matters, which economists, the world over, recognize as an indispensable asset to every country.

I am not a statistician, nor have I the information at hand to make a striking general statement on the possibilities for this country in export matters. However, I just notice the following figures on Argentine trade with the United States, Germany and England before and during the war:

	1883	1913	1917
Trade with the United States	$ 8,443,000	$ 84,727,000	$229,354,000
Trade with Germany	$11,851,000	$129,227,000	$ 294,000
Trade with England	$36,625,000	$251,254,000	$243,831,000

This basis of figures is applicable to any country, which does not manufacture. On the Continent it would include, so far as sanitary ware is concerned, the following countries: Belgium, Switzerland, Spain, Portugal, Holland, Russia, Denmark, Norway, Sweden, Roumania, Greece, Turkey, etc. Are you going to take advantage of the possibilities, or not?

Statisticts and records of the United States production in general show that not one-tenth of what was produced in this country has found its way to export trade.

If any manufacturer reading these columns has tried the export game and failed, let him tell me what he has done,

and I will show him conclusively why he has failed.

Among the inquiries I have received from our readers, the most enterprising are from the smaller concerns, and it is difficult to advise them, because it takes money to develop and build up a foreign demand, mainly because their product is only possible of use in connection with other fixtures and cannot be introduced until the main line is in demand. Also, because sanitary ware, fittings and parts are semi, or fully, technical and require the services of sanitary goods salesmen to be marketed successfully.

Question.

A Manufacturer of Plumbing Specialties Writes:

"We manufacture a complete line of plumbers' specialties, which includes every article a plumber uses, both on installation work and repair work, excepting fixtures. We also manufacture brass goods, such as basin cocks, bath cocks, stops, and stop and waste cocks. Is there a market for our goods in Euprope?"

Answer.

It is necessary to get American specialties introduced and in use in Europe more generally than they now are, before you can expect to market repair parts for them. Until American fixtures or at least American patterns are in use in Europe, you will find that the plumbers' specialties, you offer, cannot be used on the present fixtures in vogue. Therefore, your line should follow closely upon the introduction of American fixtures.

As to basin cocks and bath cocks, they can be sold at present in Europe.

* * *

Question.

An Eastern Manufacturer Asks:

"Will you have the kindness to tell us, if there are any possibilities for selling pipeless furnaces in Europe?"

Answer.

While I do not claim expert knowledge in marketing pipeless furnaces, I will endeavor, nevertheless, to give you my opinion of the possibilities.

First of all, in nearly all large cities on the Continent, Paris, Brussels, Berlin, Vienna, etc., fully 70 to 90 per cent of the people live in flats or apartments. Therefore, pipeless furnaces must be sold in the provinces or rural districts or suburbs. In England, it is different, and the pipeless furnace could be sold in large cities as well as throughout the provinces. To the best of my knowledge this line has never yet been introduced, and if you are going to attempt to do so, you must be prepared for a large educational campaign, which should be fruitful in the end, because very few houses are heated in any other manner than by grate fires. Most old houses, in fact, nearly all old houses in Europe have cellars and therefore the installation should be easily accomplished.

I doubt if you could get jobbers or heating engineers to stock your furnaces in any quantity, until you had demonstrated their efficiency and backed your demonstrations with advertising to a sufficient extent.

To succeed in establishing a price which would give you a volume of sales, much of your furnace would have to be produced in Europe, to save freight and duty, such for instance as the galvanized casings.

Undoubtedly you would have to establish assembling shops at good distributing points, such as Paris, Liverpool, Antwerp, etc., as you progressed with your introductory campaign.

In view of the educational work which must be performed with this class of goods, you should not attempt to give an agency to anyone who will not devote their entire time to your line. As a matter of fact, I consider the line as most interesting and with great possibilities, if you form a sales organization for it, not otherwise, and if I was going into it, here in the States, or in Europe, I would rather start out in Europe, but it is certainly a question as to how much of the furnace one should get made in Europe and how much of it could be imported, consequently, very much of a question as to how much an American manufacturer can be interested in, and that can only be ascertained by comparison of your costs of production, freights and duties with the same cost of production in Europe.

I should say that the pipeless furnace could be made a successful seller in Europe, if sufficient work is devoted to its introduction. As to stoves in general, I do not think American stoves can be sold excepting to Scandinavia and Russia, maybe Holland. In the other countries, castings would not bear the freight and duties under normal times and conditions. This was proven by the American Radiator Co.'s establishing European foundries, and they made a success by operating modernly equipped foundries as against the antiquated European foundries.

Marshfield, Ore.—D. H. Savage has opened a plumbing establishment in this city.

South Londonderry, Vt.—Wallace Carey has opened a plumbing establishment in this town.

Arkansas City, Kan.—C. A. Bahruth has recently opened a plumbing and heating establishment in this city.

Wichita, Kan.—Henry P. Dunaway has opened a new plumbing and heating establishment at 620 North Main Street.

Cleveland, O.—The Robert E. Morlock Plumbing Co. has recently been incorporated with a capital of $10,000. The incorporators are Robert E. Morlock, Chas. A. Thomas, C. A. Morlock, A. B. Cozens and E. M. Thomas.

JUST WHAT BILLION MEANS.

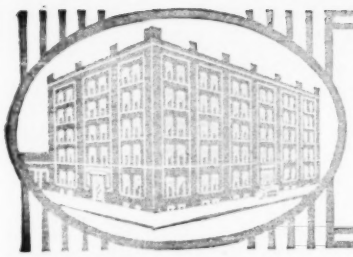
We hear of billions these days, but it is probable that very few persons have any notion of what an enormous amount of money a billion represents, says an Exchange.

We do know, however, how rapidly an expert counter of coins manipulates them. You can scarcely follow the motion of his fingers as he shifts the coins from one pile to another and counts them. The experts in the treasury department will count 4,000 silver dollars an hour and keep this up all day long, but that is their limit.

Working eight hours a day, then, an expert counter of coin will count 32,000 silver dollars in a day, but how long will it take him at that rate to count a million dollars? Thirty-one days.

But that is only the beginning of the measurements of great figures, for if the same man were to continue to count silver dollars at the same rate of speed for ten years he would find that he had counted only 100,000,000 of them, and that to count 1,000,000,000 of them would require 102 years of steady work at the rate of eight hours a day during every working day of every one of the 102 years.

Prepare for the Victory Liberty Loan!



Among the Wholesalers and Manufacturers

COMPANIES RECENTLY INCORPORATED.

The Central Plumbing Supply Co., of Bridgeport, Conn., has just been incorporated with a capital of $100,000, to conduct a plumbing supply business in that city. The incorporators are: H. F. Stensteam, Joseph Horwitz and C. W. King.

The Hohmann-Nelson Co., of Portland, Me., has been incorporated to manufacture temperature controlling devices. E. Conner is president; H. I. Smith, treasurer, and A. B. Farnham, secretary of the new company.

HAS ADDED PLUMBING SUPPLY DEPARTMENT TO ITS BUSINESS.

The Empire Machinery & Supply Co., of Norfolk, Va., has added a plumbing supply business, under the management of George Lee, who was formerly manager of the Seaboard Supply Co., of Norfolk.

W. A. MILLS BRASS CO. TO MAKE PLUMBING SPECIALTIES.

The W. A. Mills Brass Co., with plant and general offices at Port Chester, N. Y., and with New York City office at 103 Park Avenue, is preparing to add a line of plumbing specialties to its products, following the recent release from a 100 per cent Government production, for which the plant had been greatly enlarged.

WASTE RECLAMATION SERVICE TO BE CONTINUED.

Frank S. Hanley, of New York City, secretary of the Eastern Supply Association, has just announced that the Waste Reclamation Service, which was formerly a branch of the War Industries Board, will be continued, according to assurances recently made by Secretary of Commerce Wm. C. Redfield. The service was recently transferred to the Department of Commerce, and, until Congress convenes, will be carried on by that department, on appropriations made by President Wilson from his personal fund.

ABRAM COX STOVE CO. OPENS BRANCH IN NEW YORK CITY.

The Abram Cox Stove Co., of Philadelphia and Chicago, has taken over the business formerly conducted by Evins F. Glore, at 101 Park Avenue, New York City, and has established a New York branch of its business at that point. Mr. Glore has been appointed sales manager of the company with headquarters at Philadelphia. The sales force at the New York branch consists of Jack Major, K. G. Agnew, F. J. Kedenburg, R. A. Sumwalt, W. M. Gaige and V. E. Sumwalt. The Abram Cox Stove Co. is approaching the three-quarter century mark, having been established seventy-two years ago.

BUYS BUFFALO RADIATOR CO.'S BUSINESS.

The Niagara Radiator & Boiler Co., of North Tonawanda, N. Y., has purchased the business of the Buffalo Radiator Co., of Buffalo, N. Y., which was owned by W. A. Case & Son Manufacturing Co., of that city. The new owners will continue the manufacture of the Buffalo company's pattern at their own plant. The officers of the Niagara Radiator & Boiler Co. are: Edwin C. Andrews, president; A. M. Eberhart, vice-president, and W. S. Newkirk, secretary.

THE ANNUAL MEETING OF J. B. WISE, INC.

L. C. Mitchell.

J. B. Wise, Inc., of Watertown, N. Y., held its annual meeting at the concern's main offices in that city on Tuesday, April 8th, and elected officers as follows: President and treasurer, L. C. Mitchell; secretary, Miss Mary Corless; general superintendent, W. H. Perkins. Mr. Mitchell, who thus succeeds to the office of president, left vacant by the recent death of C. R. Wise, came to the concern in his youth and received his business training under the late J. B. Wise, the founder of the company. The fact that he is a most able executive made him a particularly valuable assistant to the late C. R. Wise after the death of the senior Wise. Miss Corless, who was re-elected secretary, also received her thorough business training under the senior Wise and she was made secretary of the concern when it was incorporated in 1912, in recognition of her services to the business. Mr. Perkins who was re-elected general superintendent, has also been connected with the Wise industry for a great number of years.

OPENS HEATING SPECIALTY BUSINESS.

Charles Morrison has opened a heating specialty business at 92 Pearl Street, Boston, Mass. Mr. Morrison has been connected with the heating trade in New England a number of years, and he is a member of the American Society of Heating and Ventilating Engineers.

EASTERN TRADE GOLF ASSOCIATION'S ANNUAL MEETING.

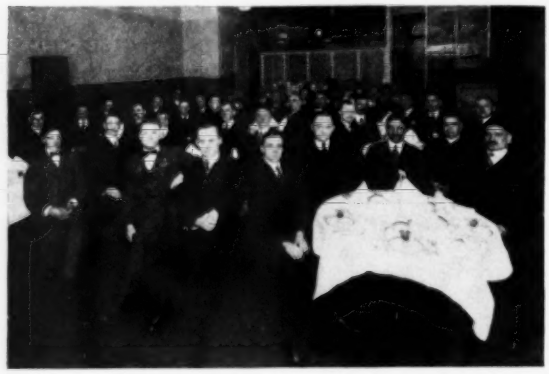
The Eastern Trade Golf Association held its annual meeting in the Building Trades' Club, 30 East Thirty-third Street, New York City, on last Wednesday. A complete report of the meeting will be published next week.

ATLANTIC RADIATOR CO. OPENS NEW BRANCH OFFICE.

The Atlantic Radiator Co., of New York City, with plants at Huntingdon, Pa., announces the opening of a branch office at 260 Plymouth Avenue, Rochester, N. Y., in charge of George S. Manson, who for the past seven years was connected with the sales force of the Spencer Heater Co., of Scranton, Pa. Prior to that Mr. Manson was with the Hunting Co., of Rochester, and is well known to the trade in the territory he will cover.

W. H. ANDERSON TOOL & SUPPLY CO.'S FORTY-EIGHTH ANNIVERSARY.

The W. H. Anderson Tool & Supply Co., of Detroit, Mich., recently celebrated the forty-eighth anniversary of the founding of its business with a dinner tendered to all its employes. The business was established in 1871 by W. H. Anderson, who was active in the organization up to the time of his death in 1914. The original business consisted in the manufacture of tools used in the working of stone, marble and granite. Later the manufacture of tools for plumbers, steamfitters, foundrymen, etc., was added. At the recent dinner attention was called to the fact that in spite of being in business for nearly half a century, the company has never had a serious accident. Another reason for congratulation was the record which the company has established for keeping its employes. One of its men has seen 39 years of continuous service, one 29 years, one 27 years, three 25 years, one 18 years, two 14 years, two 10 years, one 8 years, four 6 years, and a considerable number 4 and 5 years. The officers of the company are: J. D. Anderson, president; C. J. Anderson, vice-president; W. R. Anderson, secretary, and A. G. Shuck, treasurer.



The Annual Dinner of the W. H. Anderson Tool & Supply Co., Detroit, Mich.

NEW CONSTRUCTION WORK.

Among the more notable building enterprises, which will soon be started, "American Contractor" records the following:

$100,000 garage, Washington, D. C.; owner's name withheld.

$215,000 armory, Philadelphia, Pa.; State of Pennsylvania.

$2,000,000, 600 houses, Philadelphia; United States Emergency Fleet Corporation.

$100,000 shoe factory, Beaver Dam, Wis.; F. Weyenberg Shoe Co.

$150,000 bank, Mobile, Ala.; Merchants Bank.

$180,000 office building, Chicago; Union Stock Yards.

$175,000 factory, Chicago; O'Malley-Beare Valve Co.

$300,000 mercantile bank, Detroit, Mich.; Wm. H. Turner.

$627,507.50 sand water filtration plant, Hartford, Conn.; Water Department, Hartford.

$250,000 college extension, College Campus, Pa.; Seaton Hill College.

$125,000 high school, West Unity, O.; Board of Education.

$200,000 three-apartment building, St. Paul, Minn.; Hennepin Lumber Co.

$125,000 tannery, Bay View, Wis.; Fred A. Vogel.

$500,000 theater, stores, offices and apartments, New York City; Eighteenth Street Construction Co.

$150,000 grain warehouse, Stamford, Conn.; C. E. Slawson Co.

EXPORTS IN FEBRUARY REACH A HIGH FIGURE.

Exports for February continue to show increase in volume, the total reaching $588,000,000, according to a statement issued by the Bureau of Foreign and Domestic Commerce.

This is a falling off from the January record of $623,000,000, but as there were only 28 days in February the daily average would seem to be even higher than in January.

The total for the month represents an increase of approximately 43 per cent over the $411,000,000 in February last year. Exports for eight months ended with February were $4,386,000,000, as compared with $3,862,000,000 for the corresponding period last year.

February imports are announced as $235,000,000, a gain over the $213,000,000 for January, and over the $208,000,000 for February, 1918. Imports for the eight months ended with February totaled $1,933,000,000 as against $1,841,000,000 for a similar period the previous year.

Mr. deCourcey Cleveland has resigned as president of the Central Foundry Co., of New York City, and its subsidiaries. The resignation will take effect May 1st. Mr. Cleveland has been with the company since 1910.

S. H. Moon, vice-president and secretary-treasurer of the Standard Sanitary Manufacturing Co., of Pittsburgh, Pa., was in Chicago on Saturday, April 5th.

F. R. Still, vice-president and secretary of the American Blower Co., of Detroit, Mich., has just left on an extended trip for the Far East, including Japan, China, Australia and most of the European countries. Mr. Still will investigate trade conditions in connection with export work, and he expects to travel more than 35,000 miles before reaching his home about November 1st.

Olin F. Chellis, president of the Dalton-Ingersoll Manufacturing Co., of Boston, has just rounded out 35 years of service with this concern. Mr. Chellis started with the company as an office boy, when he was 15 years of age, and worked his way up to the presidency. He traveled for the company for 25 years, a salesmanship record that it would be difficult to duplicate among Boston supply houses.

W. A. Brecht, of J. B. Wise, Inc., Watertown, N. Y., was in New York City last week.

H. B. Hallett, of the W. A. Case & Son Manufacturing Co., of Buffalo, N. Y., passed through Chicago early this week on an extended trip to western jobbing centers.

H. S. Maddock, of the Thomas Maddock's Sons Co., of Trenton, N. J., has just been released from the hospital following an operation in one of his ears, and his many friends will be glad to know that he is now practically fully recovered.

S. W. Tucker, secretary and treasurer of the Cleveland Flush Meter Co., of Cleveland, O., has just returned from a six weeks' trip through the South, on which he visited several resort cities in Florida and also made a short stop at Atlantic City. The trip was one on which Mr. Tucker combined business with pleasure.

U. S. Grant, for many years Philadelphia manager for the John Douglas Co., of Cincinnati, has become associated with Bridgman Bros. Co., of Philadelphia. The latter company recently took over the Pennsylvania agency for the Douglas company's products, and Mr. Grant will thus continue to be interested in the line of goods he has known for so long.

J. W. Oliver, Louisville, Ky., of the Ahrens & Ott division of the Standard Sanitary Manufacturing Co., of Pittsburgh, recently retired as president of the Louisville Board of Trade, on which occasion he was presented with a handsome silver pitcher, carrying the engraved signature of every member of the retiring board of directors. Mr. Oliver was at the head of the Louisville Board of Trade two years.

Cliff Mahaffey.

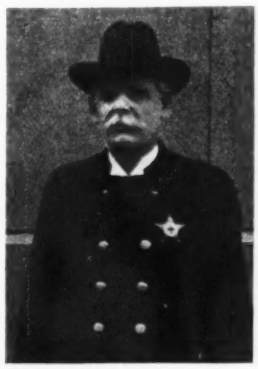
Cliff Mahaffey, formerly Pittsburgh sales manager of the Ruud Manufacturing Co., has become associated with the Speakman Co., of Wilmington, Del., as western representative with headquarters in Chicago. Mr. Mahaffey has been connected with the plumbing supply trade for more than twenty years, first with the Standard Manufacturing Co., of Pittsburgh, and later with the Sanitary Co., of Cleveland, O., and he is, therefore, well qualified for his new duties.

George D. Wilcox, Jr., formerly advertising manager of the Detroit Lubricator Co., Detroit, Mich., has returned to this country after serving nearly 18 months in France. Mr. Wilcox was attached to the Aero Squadron, and after being mustered out at Camp Grant, Rockford, Ill., spent a day with his friends in Chicago, before going on to his home city. It is a pleasure to record that there is a likelihood of Mr. Wilcox continuing in the field, in which he was engaged before he decided to serve Uncle Sam. Mr. Wilcox comes of a fighting family, his father being Major George D. Wilcox, who was in charge of the Motor Truck Division.

R. F. Kelley, of the L. B. Brass Co., of Peabody, Mass., was a visitor in New York last week.

F. R. Bishop, of the Hawkeye Supply Co., Mason City, Iowa, was in Chicago this week.

B. E. Culbertson, who has been in the service of Crane Co. for eighteen years, principally in the St. Louis and Cincinnati offices, has been appointed assistant manager of the company's branch in Des Moines, Iowa.



Charles B. Ball.

Charles B. Ball, chief of the Sanitary Bureau of the Department of Health, Chicago, left Chicago Wednesday and sailed yesterday from New York for Paris, France, having been chosen as one of the experts constituting the newly created Army Educational Commission of the A. E. F. Mr. Ball will be attached to the Division of Housing and Community Planning, which is one of seven fields selected by the commission. The plan is partly to endeavor to intensify the interest of men overseas in the opportunities and obligations underlying citizenship, and the educational work is divided into several divisions. John Nolen, chief of the Department of Citizenship, has sent Mr. Ball a preliminary outline of a score of lecture subjects, which will include displays of moving pictures and lantern slides. Mr. Ball will be gone for an indefinite period, at least seven or eight months, and his long experience in this field eminently qualifies him to teach the young men overseas many things that will make them better citizens when they return home to this country.

Andrew P. Dease, for several years Chicago manager of the L. J. Mueller Furnace Co., Milwaukee, Wis., and later connected with the Stolz Smokeless Furnace Co., Chicago, has become connected with the Scheible-Moncrief Heater Co., Cleveland, O. Mr. Dease will cover Illinois and Indiana, and his many friends in the trade are tendering best wishes for his continued success in the heating business.

NEW APPLIANCES AND IMPROVEMENTS.

A Pipe-Wrench Improvement.

A recent improvement in chain pipe wrench efficiency has been made whereby the scope of the work has been extended to include flanges. The attachment, which takes the place of the chain, is simply a flange link, which is securley held in place by a loose steel pin. With this device a grip at two points of contact is attained, at each

A Pipe-Wrench Improvement.

edge of the flange, thus providing tremendous leverage and gripping so tenaciously that it cannot slip. The flange attachment is reversible and can be used on either side of the flange. The use of this attachment permits an exceptionally wide range of work, its capacity for flange work exceeding the pipe capacity of the tool. It constitutes a three-in-one tool, permitting work on pipe, fittings and flanges. It is furnished in six sizes, ranging from ½-inch to 20-inch pipe.

This is one of several piles of Copper Ingots at the Water Street Plant. Circular insert shows stacks of pure zinc which is melted with copper in the making of brass for "Wiseco" Products.

J. B. WISE, Inc.

Manufacturers of Plumb

Compounding the Brass

The initial step in the making of "WISECO" Products which requires more than ordinary skill

COMPOUNDING of brass for "Wiseco" Products entails more than the ordinary procedures and requires exceptional skill to maintain the uniformly high standard of quality of this metal.

The copper ingots and zinc (or spelter) are shipped from the smelters in car load lots, each car containing from 80,000 to 100,000 pounds.

Upon reaching the sidings of our Water Street Plant chemists analyze samples of the metals to determine whether or not the raw products come up to the specifications under which they were purchased. In fact all raw materials such as mould oils, etc., entering into the compounding of "Wiseco" brass are thoroughly analyzed.

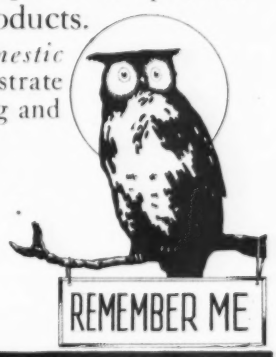
The copper and spelters in their prescribed percentages are placed in crucibles for melting.

"WISECO" Products

Now we enter into one of the most interesting departments of the "Wiseco" organization where expert casters under capable supervision watch over batteries of fires and moulds and at *just the right time* pour the molten brass into moulds ready for the next steps in the production of "Wiseco" Products.

In the next issue of *"Domestic Engineering"* we will illustrate and describe the melting and casting processes.

Do not miss one of this series of interesting manufacturing methods.

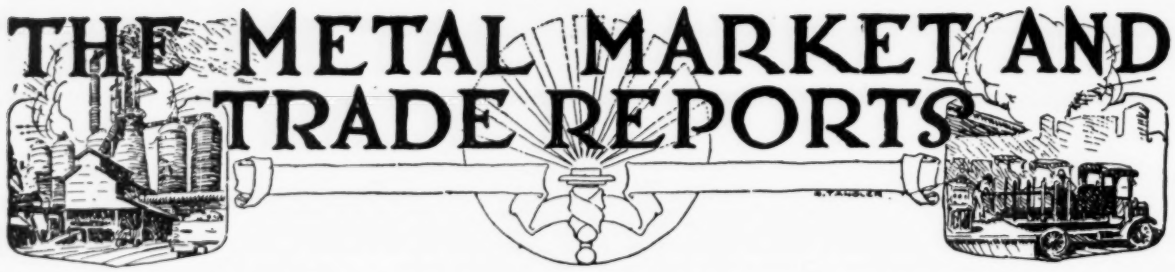


Watertown, N.Y.

...s' Sanitary Brass Goods

...when writing advertisers.

THE METAL MARKET AND TRADE REPORTS



Steel and Iron.

A decided slump in the steel market took place last week, as soon as it was learned that the Railroad Administration would not sanction purchases of rails at the reduced figures adopted by the representatives of steel producers and the members of the Industrial Board of the Department of Commerce. Conditions now are decidedly more unsettled than at any time since the signing of the armistice, and the unexpected setback which producers are facing, has brought a revulsion of feeling which is harmful to a normal readjustment to a peace basis. Consumers as a whole feel that it is useless to try to enter the market while the present uncertainty prevails, and producers are showing but little inclination to censure the buyers. Mill operations have dropped to a low rating, as orders that could be classed as new business have shown a shrinkage, and aside from some tonnages which were pending before the Industrial Board's action, little new business has been done, because of the uncertainty which is present in the industry. Just how long these conditions will prevail is an open question. The trade seems to be of the opinion that the controversy is one that should be taken to the President, since it was he who first gave approval to the stabilizing scheme proposed by Secretary Redfield. The leading question at present is how soon there will be an agreement, which will restore confidence to consumers and permit of large orders at the new prices.

There is but little cause for optimism in the pig iron situation, since the Industrial Board handed down its decisions with regard to price reductions. At that time there was a marked absence of buying, and the only sales, which were recorded, were for immediate shipment and to fill immediate needs. Orders were few, small and far between. The news to the effect that the Railroad Administration was unwilling to make purchases of supplies at current prices was taken as a sign that unsettlement in the iron industry would be a long-drawn-out affair, and that unforeseen difficulties might arise. Open market conditions might develop, if the President is unable to reconcile the Railroad Administration to the price schedule submitted by the Industrial Board.

Prices are as follows:

No. 2X, Philadelphia	$31.90
No. 2, Southern, Cincinnati	30.35
No. 2 Foundry, Chicago	26.35
Basic Valley, furnace	25.75
Bessemer, Pittsburgh	29.35

Copper.

The trend of the copper market was somewhat downward last week, but the situation is still considered favorable, and no apprehension is felt on the part of dealers. The range quoted by sellers toward the close of the week was from 15¼ cents per pound f. o. b. New York, by the smaller interests, to 15½ cents per pound, by the larger producers. Demand was not so brisk as it has been, and the trade debated as to whether or not there will be another lull in buying.

Tin.

The situation in the tin market remains unchanged, and there are no indications pointing to any change, at least until the price of 72 cents per pound is set aside and open trading is resumed. The date, which has been set by the trade, is around the first of June, and the decision on the date has been arrived at in the trade through estimates on the length of time which will be consumed in the liquidation of the last half of the tin allocated to the United States through the U. S. Steel Products Co., by authority of the Inter-Allied Tin Executive in London.

Lead.

The lead market is quiet. Outside interests were quoting a range from the A. S. & R. price to five points above. The American Smelting & Refining Co.'s price has remained at 5.25 cents for New York delivery, for a long time, and present indications point to little further change. The East St. Louis price is 5 cents flat.

Spelter.

Advices from Washington indicate that the War Department is about to embark on a sale scheme in almost every particular similar to that which has been agreed upon for copper, in order that Government stocks of spelter will be returned to the trade in small quantities, the marketing to be done over an extended period, and for the benefit of the trade. The last quotations were around 6.30 cents to 6.35 cents per pound, and the leading interest stated that business is dull.

Other Metals.

Quotations on other metals in New York are as follows:

Aluminum (in 50-ton lots)	29 cents per lb.
Antimony (Chinese and Japanese)	11 cents per lb.
Solder, No. 1	41½ cents per lb.

New York Old Metal Market.

The following prices are current for old metals:

	Buying.	Selling.
Copper, heavy	12¾ to 13¼ cents	14 cents
Copper, light	11½ to 12 cents	13 cents
Brass, heavy	7¾ to 8¼ cents	9 cents
Brass, light	6½ to 6¾ cents	7½ cents
Brass, turnings	7½ to 8 cents	8½ cents
Tea lead	3½ cents	4¼ cents
Lead, heavy	4¼ to 4½ cents	5 cents
Zinc	4½ cents	5¼ cents
Solder joints	10½ to 11½ cents	12 cents
Mixed babbit	5 to 7 cents	7½ cents
Cocks and faucets	11 to 11½ cents	12½ cents
No. 1 composition	13 to 13½ cents	14½ cents
Composition turnings	10½ to 10¾ cents	11¼ cents
Aluminum clippings	20 to 21 cents	22 cents
Tin foil	40 to 43 cents	45 cents
Pewter	35 to 40 cents	42 cents
Old sheet aluminum	18 to 19 cents	20 cents
Cast aluminum	17 to 18 cents	19 cents
New brass clippings	8¾ to 9¼ cents	10 cents
Yellow cast brass turnings	7½ to 8 cents	9 cents
Yellow brass castings	9 to 9¼ cents	10 cents

BOILERS AND RADIATION SHOW FURTHER PRICE REDUCTIONS.

Conditions in Chicago and Surrounding Territory Are Improving and Indicate Considerable Buying When Building Gets Under Way.

Chicago, April 10.—Willingness on the part of manufacturers of heating equipment to instill confidence in the buying public and stimulate building by reducing prices as far as consistent with present manufacturing costs, is evidenced in the announcements made during the past week. The American Radiator Co. has reduced prices on direct and indirect radiation 15 per cent, wall radiation 12½ per cent and boilers 10 per cent. Crane Co. also issues reductions of iron and brass valves ranging from 10 to 20 per cent. These changes in quotations, on top of the earlier reduction of 25 per cent on pottery and boilers, and the more recent cut in soil pipe and range boilers, are tangible indications of the attitude of manufacturers in this field, all of whom are anxious to see an early resumption of building.

There is no question that architects are very busy, judging from local reports and those of men who have recently returned from points as far east as Rochester, west to Iowa and Nebraska, and from the southwest and northwest districts. Everywhere it is the same story of architests asking for figures, and even if the actual placing of orders is not heavy at this time, manufacturers and jobbers are practically unanimous in their optimism. It is felt that this increased activity will gain momentum so far as orders are concerned as soon as building gets under way.

Building permits in Chicago for March showed an increase of 110 per cent over the same period of last year and during the past few days permits have been issued for another million dollars' worth of building, including all classes of structures.

In some quarters it is felt that the continued high prices of brick, lumber, etc., are responsible for the lack of immediate activity. The Senatorial Investigating Committee, which has been meeting in Chicago for some time past endeavoring to find out why common brick continues to remain at $12 a thousand, has so far not completed its findings. Lumber prices are firm, and the latest reports from Washington contain no news about lower quotations. Others attribute the hesitancy on the part of builders to the attitude of Director General Hines because he is holding back railroad purchases, thus showing a lack of confidence in the prices that have been set in conference. In this connection the Illinois Manufacturers' Association has communicated directly to President Wilson protesting against the inactivity of the Railroad Administration.

Chicago jobbers have recently taken the initiative by reducing prices from 5 to 10 per cent on the cheaper grades of staple plumbing ware even though prices from the factory are unchanged. Buying on the part of the jobber is in some cases being gauged by the actual orders he has on hand and stocks are being kept low. There is a better feeling, however, in other quarters and orders have been placed in carload lots for mixed staples of enameled ware. Pottery is not in heavy demand, due to the fact that stocks bought last year are still in fairly good condition and specifications are still being sent in on orders placed at the time the Government restricted the manufacturers' output.

The range boiler situation shows some improvement. Orders for carload lots have been placed during the past week, but more encouraging than that is the increasing number of small orders, indicating a more widespread demand. While this is not the busiest season for air valves, business is reported satisfactory throughout the Middle West and inquiries for plumbers' brass goods are better than for some time past.

Radiator valve business is picking up, but there is a tendency on the part of the jobber to refrain from stocking up at this time, and orders are of the hand-to-mouth variety. It is felt that waiting till fall before buying will not improve the situation in this market and in view of the reductions in prices just announced and the amount of building already planned for 1919, buying for future needs may soon become more pronounced.

Conditions in the boiler and radiator field reflect the same general feeling. Business is encouraging and reports from the Chicago territory are good. Now that Government restrictions have been removed, the way is paved to market new types of heaters that were held up during the war. A strong effort is being made to get things started. Salesmen are covering smaller territories and using automobiles.

A full-page advertising campaign is being conducted in the Chicago daily newspapers by the retail lumber dealers of Chicago and Cook County to stimulate building, which may bring about an earlier resumption of active building.

The Pipe Market.

Quotations on less than car lots of full weight steel pipe are as follows:

	Butt Weld		Lap Weld	
	Blk.	Galv.	Blk.	Galv.
⅛ to ⅜ inch	43½	15½	.....	.....
½ inch	47½	31½	.....	.....
¾ to 3 inch	50½	35½	.....	.....
2 inch	.....	.....	43½	29½
2½ to 6 inch	.....	.....	46½	32½
7 to 12 inch	.....	.....	41½	26½

The quotations apply to all shipments from stock, regardless of quantity.

On extra strong and double extra strong steel pipe in less than car lots, quotations are as follows:

	Extra Strong				Double Extra Strong			
	Plain Ends		Plain Ends		Plain Ends		Plain Ends	
	Butt Weld		Lap Weld		Butt Weld		Lap Weld	
	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.
⅛, ¼ and ⅜ in.	34½	9½	.....	.....	.....	.....	.....	.....
½ inch	39½	14½	.....	.....	27½	.....	.....	.....
¾ to 1½ inch	43½	18½	.....	.....	30½	.....	.....	.....
2 to 2½ inch	44½	19½	.....	.....	32½	.....	.....	.....
3 inch	44½	19½	.....	.....	.....	.....	.....	.....
2 inch	.....	.....	36½	11½	.....	.....	25½	.....
2½ to 4 inch	.....	.....	39½	14½	.....	.....	27½	.....
4½ to 6 inch	.....	.....	38½	13½	.....	.....	26½	.....
7 to 8 inch	.....	.....	32½	7½	.....	.....	19½	.....
9 to 12 inch	.....	.....	27½	.....	.....	.....	.....	.....

With threads only, the basing discount is one and one-half points lower. With threads and couplings the basing discount is three points lower. The quotations apply to all quantities less than car lots.

Quotations on full weight genuine iron pipe, in less than car lots, are as follows:

	Butt Weld		Lap Weld	
	Blk.	Galv.	Blk.	Galv.
⅛ and ¼ inch	20½	+8½	.....	.....
⅜ inch	21½	+7½	.....	.....
½ inch	25½	5½	.....	.....
1¼ inch	30½	12½	.....	.....
¾ and 1 inch	30½	12½	.....	.....
1½ inch	30½	12½	.....	.....
2 inch	.....	.....	23½	7½
2½ to 6 inch	.....	.....	25½	10½
7 to 12 inch	.....	.....	20½	5½

These quotations are f. o. b. Pittsburgh, and apply to all shipments from stock, regardless of quantity.

(Continued on Page 85.)

AMONG THE PLUMBING AND HEATING CONTRACTORS

Illinois

Chicago and Vicinity.

A bill has been introduced in the Illinois State Legislature to repeal the present plumbing law. It is known as Senate Bill 318, and was introduced by Senator Turnbaugh, on March 26th. The bill has been referred to the Judiciary Committee. At the last convention of the Illinois State Association of Master Plumbers, the organization went on record as being against any active legislation in regard to repealing the law at this time, and the journeymen are in accord with the master plumbers on this matter. In view of the bill that has been introduced, the matter will be taken up by the legislative committee of the state association.

The examining board of the city of Chicago during the month of March reports that the following applications for master plumbers' certificates were granted: Chas. P. Baumgarten, 3220 Walnut Street; Goion DeLoach, 3136 Jackson Boulevard; Chas. Franzel, 507 Garfield Avenue; Chas. Harris, 1508 Harrison Street; John S. McKenzie, 5119 Chicago Avenue; Otto Waldvagel, 2430 South Fifty-sixth Avenue; R. Brush, 4951 Broadway, and B. F. Kinder, of Desplaines.

The working agreement that has been in operation for some time between the master plumbers of Chicago and the Peoples Gas, Light & Coke Co., regarding the installation and sale of automatic gas water heaters, will be extended to include small tank heaters. The arrangement covering gas water heaters is a flat rate of $25 for the connection of the heater, in addition to a commission of 20 per cent, whether the sale is made directly or indirectly, to the consumer. The plumber gets his commission irrespective as to whether the consumer pays cash or installments.

J. H. Keller, of 5915 Iowa Street, has secured the contract to install modern plumbing in a number of bungalows on Flournoy Street, between 5436 and 5460.

J. J. Herlihy, of 751 West Van Buren Street, has been awarded the contract to install the heating system in the addition to the school at 2116 East Seventy-second Street. The plumbing contract was awarded to the Stanley Plumbing & Heating Co., of 6554 Cottage Grove Avenue.

Wm. Mallow, of 4343 Lincoln Avenue, has been awarded the plumbing contract in two residences at 5242 and 5256 Belle Plaine Avenue.

Ernest Beattie, of 1609 South Wabash Avenue, has secured the plumbing contract in the church being erected at Fifty-eight Street and Twenty-second Place.

J. J. Daly, of 408 North Wells Street, has secured the contracts to install modern plumbing in a warehouse at 657 West Fulton Street, and in a factory at 4226 South Western Avenue.

Roberts Plumbing Co., of 4544 North Western Avenue, has been awarded the contract to install modern plumbing in three residences at 5930, 5932 and 5936 North Hermitage Avenue. The heating contract on these residences went to A. K. Baker, of 3547 Lincoln Avenue.

Henry Breyer, of 2125 Milwaukee Avenue, has been awarded the plumbing contract on a bakery being built at 1753 North Tripp Avenue.

E. Stevenson & Co., of 6142 South Western Avenue, have secured the contract to install the plumbing in two residences at 6526 and 6528 South Artesian Avenue.

Fred Oakes, of 3634 Fullerton Avenue, has been awarded the plumbing contract in four residences at 49, 34, 38 and 40 North Keystone Avenue.

Thos. Prentice, of 1233 East Seventy-fifth Street, has secured the contracts to remodel the plumbing and heating systems in an office building in Ravenswood.

M. J. Kelly, of Archer Avenue, has secured the contract to install steam heating in a store building at 6302 Archer Avenue.

H. F. Miltag, of 2844 North Cicero Avenue, has secured the contract to install the plumbing in a residence at 4726 Nevada Street.

J. Cepican, of 1913 West Fifty-first Street, has been awarded the plumbing contract on a cottage at 5309 West Fifty-third Place.

C. C. Breyer, of 1545 West Division Street, has secured the plumbing contract on an ice storage building at 1923-1925 Webster Avenue.

G. Breetzke, of 907 West Sixty-third Street, has been awarded the contract to install modern plumbing in a $50,000 apartment building at Sunnyside and Hazel Avenues.

J. Kleker, of 1707 West Forty-seventh Street, has secured the plumbing contract on a flat building on Albany, between Forty-first and Forty-second Streets.

G. L. Rood, of 136 West Lake Street, has been awarded the contract to install the heating system in a residence and garage at 8311 South Shore Drive.

R. Lindvall, of 1244 South Fifty-ninth Street, has been awarded the plumbing contract on a residence at 3231 West Sixty-second Place.

F. W. Fullmer, of 185 North La Salle Street, has been awarded the contract to install modern plumbing in a store and basement building being remodeled at 177 North Michigan Avenue.

O'Callaghan Bros., of 157 North Market Street, have been awarded the contract to install the plumbing in a $25,000 residence on Fair Oaks Avenue, north of Chicago Avenue. The heating contract on this job went to the David Construction Co., of 56 West Kinzie Street.

Fred Dilzer, of 58 West Kinzie Street, has been awarded the contract to install the heating system in a $10,000 barn between Fort Sheridan and Highland Park. H. Breyer, of 2125 Milwaukee Avenue, was awarded the plumbing contract on this building.

The Arcade Steam Heating Co., of 126 West Kinzie Street, has been awarded the contract to install the heating system in a store and loft building at 227 West Washington Street.

J. G. Weber Co., of 2841 North Clark Street, has secured the plumbing contract on a dormitory being re-

modeled for the Moody Bible Institute, at 153 Institute Place.

G. T. Schampel, of 175 West Washington Street, has secured the contract to install the heating system in three bungalows at 7320-7328 Indiana Avenue. The plumbing contract on these bungalows went to F. Dahlstrom, of 446 East Seventy-sixth Street.

Morris Katz, of 814 Taylor Street, has been awarded the contract to install modern plumbing in two store buildings being remodeled, on South Millard Avenue.

Other Cities in the State.

The Western Plumbing and Heating League held its regular meeting in Joliet on Wednesday evening, April 2nd, with a good attendance. The members of the league enjoyed dinner at the Woodruff Inn, and, following the dinner, trade topics of current interest were discussed. The meeting was in charge of President Martin Nelson and Secretary T. E. Walters.

A. Decker, of 386 Central Avenue, Highland Park, has been awarded the contracts to install the plumbing and heating systems in the $10,000 addition to a club house in that suburb.

Missouri

St. Louis and Vicinity.

Charles A. Weber, Academy and Hoadimont Tracks, reports an unusual increase in overhauling during the past week. He said that business in that line is steadily increasing.

A choice piece of contract work, which is being sought after by many plumbing contractors, is that of a new building at Columbia, Mo., for the Missouri University's School of Journalism. It will be a large and costly structure. As far as could be learned no contracts for any of the work have been awarded as yet. James P. Jamieson, with offices in the Security Building, is the architect.

L. McNamara, president of the National Association of Master Plumbers, is in Pittsburgh, attending a conference with the Finance Committee of the Trade Extension Committee. Secretary Blake is attending to the duties of President McNamara during the latter's absence.

The Board of Public Service of St. Louis is seeking sealed bids for furnishing tools, material and labor and for covering complete in place the high-pressure, steam pipes at the Baden Service Station, in North St. Louis. Another piece of work that is open for sealed bids is the construction of sewers in the Zypher Hills district, in Maplewood, Mo., west of St. Louis. Bids for this work are being received by the Maplewood city clerk.

S. A. Kiernan, of St. Louis, National Chairman of the Ladies' Auxiliary, with a Group of Ladies at the Hannibal Convention of Missouri Master Plumbers' Association.—From "Domestic Engineering" Photo.

The building of the Hencke-Werner Plumbing Co., 2335 South Grand Avenue, is being remodeled. Interior decorations will be entirely changed, and more floor space will be provided. Expansion of the business was given as the reason for the alterations, the Hencke-Werner Co. being one of the most prominent of local firms. Office space will take up the entire front of the building, stock and work rooms being planned for the rear.

The Graham Plumbing & Heating Co., 1400 Academy Avenue, reports a large business in overhauling and remodeling, although it was stated that contract work, while on the increase, has been below normal for the past few weeks. Charles F. Graham, president of the company, declared that plumbing and heating men are more fortunate than many other building trades, inasmuch as they have a large field to fall back on, until building conditions return to normal. He pointed out that much work has been neglected during the war and that many old homes are in need of complete over-hauling of plumbing systems. Heating engineers have not the quantity of work in this city that they had last year, however. This is attributed to the unusually mild winter and the comparatively mild "workout" given heating systems.

Indiana

Indianapolis and Vicinity.

That Indianapolis is rapidly approaching a normal condition, as far as building is concerned, is evidenced by figures just compiled by Blaine H. Miller, city building commissioner, relative to building permits issued in January, February and March with comparison of the building operations in the same months of previous years. The first three months of 1918 were, of course, bad months for building, both on account of weather conditions and the war, and the total valuations of permits issued was only $720,417. In the same period during the present year the total valuations of permits reached $1,185,174, an increase of $464,757. Other figures which indicate that building operations will soon equal those of former years, in which there were no untoward conditions to curb such operations, are those of the first three months of each year since 1913. In the first three months of 1914, $1,558,723 in building permits were issued; in 1915, $1,466,256; in 1916, $1,660,209; in 1917, $1,986,193, and in 1918, $720,417. Taking the highest figure and the lowest figure in this period of five years, namely, in 1916 and in 1918, an average of $1,190,313 is obtained, or an increase of only $5,139 over the amount of building operations for the first three months of this year. Mr. Miller's report on building operations for the month of March shows that 606 permits were issued on property valuations estimated at $529,314. In the same month of last year 462 permits were issued on buildings estimated to cost $334,719.

Improvement and repairs in the heating and ventilating systems in several public school buildings in Indianapolis are to be discussed next week by a special committee representing the board of school commissioners and the firm of Snider & Rotz, consulting engineers to the board. The special committee will select buildings, which are to be retained in service under the new building program, and where the need for improvements is urgent. It is said that work will be begun first on buildings where school work is hindered by lack of proper sanitary heating or modern ventilation facilities.

Gary and Vicinity.

One hundred and five building permits, valued at $358,295, were issued during the month of March in Gary, composing the greatest volume of construction business ever done in that city. Records in the office of the building commissioner show March, 1919, as the greatest building month since March, 1910. Previous to that time the building commissioner's office was not in operation and as a result accounts of operations before that time are not available. An interesting feature of the March business was the average price of the buildings erected. Taking the entire volume of business into consideration it is shown that single structures cost more than $3,000 each. Last year the late fall season showed industrial homes costing approximately $2,500. Comparisons show that the cost of building material is about the same. That 1919 will make building history is evidenced from the records of the first three months of this year as compared with the records of other years. Last year, second largest as a construction year, since the building commissioner's office was opened, found 112 permits issued up to April 1st, at a total cost of $298,530. This year 172 permits have been issued and the total cost is $587,087, nearly twice as much, as during 1917.

The Peoples Hardware Co., of Gary, has been awarded the contract for the installation of the plumbing and heating systems in two new $10,000 apartment buildings to be erected at 825-827 and 832-834 Virginia Street, for the Revescz Home Building Co., of that city. This company also has the plumbing and heating contracts on the new $8,000 residence now being erected for Frank Hall, 537 Broadway.

Other Cities in the State.

The Hipskind Plumbing & Heating Co., of Wabash, has received the contract for the installation of plumbing and heating systems in the new home for nurses that is to be erected at the Huntington county hospital grounds. The contract amounts to $4,045.

A. V. Sampsel, of Peru, was the successful bidder for the heating contract on the new county infirmary building that is to be erected a short distance north of Peru for Miami County. The building will cost about $60,000.

Cincinnati and Vicinity.

Probably the largest project of its kind in the history of Cincinnati, which will entail extensive plumbing, heating and ventilating contracts, was decided upon Saturday, March 29th, when the Rapid Transit Commission unanimously selected Government Square as the main terminal of the new Rapid Transit Loop System. The placing of the terminal has been the subject of much discussion, downtown business men advocating Government Square, while the men farther up town wanted it situated at the old canal, between Walnut and Vine Streets. A compromise was effected by making the canal site the station for interurban cars, and the downtown station the main station for the loop trains. Representatives of committees on both sides expressed themselves as being well pleased with the decision of the commission.

Immediately after the meeting spoken of in preceding paragraph, Harry L. Linch, managing director, of the Dixie Terminal Co., gave Garber & Woodward, architects, instructions to include in their plans a method of connecting the main station of the loop with the Dixie Terminal, which will be one square south of the loop station.

Actual work will start in a few days on the Dixie Terminal. This project has been much delayed because of the lack of storage space for structural steel. It is to be a modern office building, as well as a station for all cars running into Cincinnati from Kentucky. The Ohio Building & Construction Co. is the contractor for the erection of the office building; Thomas J. Dreyer Co., for the plumbing, and Henry Niemes for the heating and ventilating system.

Representatives of the Pennsylvania Lines and the Baltimore & Ohio System conferred with the trustees of the Cincinnati Chamber of Commerce last week in regard to the erection of a new union depot at Hamilton. A preliminary survey will be made in the near future.

The Mahoning Valley Delegation at the Youngstown Convention of Ohio Master Plumbers' Association.—From "Domestic Engineering" Photo.

Friday evening, April 4th, the Cincinnati Lodge of Elks voted for the erection of a new temple, at an approximate cost of $100,000. A committee to select the site has been appointed.

The Dow Drug Co. has two improvements under way, each entailing the expenditure of approximately $20,000. One is the remodeling of the first floor of the Greenwood Building, at Sixth and Vine Streets, and the other is in the Lincoln Bank Building, at Fourth and Vine Streets.

Michigan

Detroit and Vicinity.

Ray Cook has moved his plumbing business from 328 Fifth Street to more modern quarters at 96 West Adams Street, where he has arranged an exceptionally attractive show-window.

Architect C. Howard Crane, of 2323 Dime Bank Building, is preparing plans for a $15,000 residence at 427 Boston Boulevard, for John P. Frazer, of 818 Hammond Building.

Architect J. G. Kastler, of 524 Chamber of Commerce Building, is preparing plans for a 24-family apartment building on East Grand Boulevard, near Medbury.

Morris Harris, of 634 Brush Street, is having plans drawn for a flat building and garage on St. Ferry Avenue, between Brush and Beaubien Avenues.

Architects Oppenheimer & Speer, of Spencer Building, are preparing plans for a $50,000 factory to be erected at 621 Bellevue Avenue.

Lansing.

Will L. Barnes has been awarded contracts for the plumbing work in two residences belonging to M. H. Rose, the installation of a heating system in a residence owned by the Union Building & Loan Association, and is completing the heating work in a storage building at 315½ Washington Avenue, all in Lansing.

New Jersey

Camden and Vicinity.

Wm. J. Kelly, of Camden, is installing plumbing and heating systems in the new factory being built for R. M. Hollingshead.

Wm. E. Lovett, of Camden, has secured the contract to install plumbing in a new bungalow being erected in Collingswood, N. J.

Trenton and Vicinity.

Slaack & Bennett have been awarded the contract to install modern plumbing in the new residence being erected in that city for J. Graziano.

Clarence Cowan, of Atlantic City, has secured the plumbing contract on an apartment house being erected on Maine Avenue, in that city.

New York

Brooklyn Plumbers' Victory Loan Drive.

The Brooklyn Association is making preparations for the coming Victory Liberty Loan drive, which will open April 21st. Another race for the honor flag of the building trades will be made, and it is hoped that M. J. Kennedy will again accept the management of the work.

The Brooklyn Home-Coming Celebration.

Arrangements for the proposed open meeting and reception to home-coming soldier members of the Brooklyn Association of Master Plumbers is beginning to take definite form. The affair will take place some time in May, and Johnson Hall in the Johnson Building, on Nevins Street, will be the scene of the festival occasion.

Brooklyn Master Plumbers Studying Bookkeeping.

Further progress in the work of the Jobbing Committee of the Brooklyn Association of Master Plumbers was developed at its last meeting, held on Wednesday evening, April 2nd, when it was announced by the Educational Committee that it had examined a number of simplified bookkeeeping systems and is now prepared to offer several as adaptable to the jobbing plumbers' needs. In this connection, the advantage of attending these meetings of the committee was emphasized in the announced purpose of those in charge to explain the application and handling of these systems to the individual, so that each member, seeking information on the subject, will have the advantage of personal attention and the guidance of the committee. The committee is of the opinion that such personal contact and explanation of the work, as it should be done, will be more desirable and effective than distributing the matter in print.

The report of the collection committee reflected the effective work being done in this department. All claims to date have been settled to the entire satisfaction of the claimant members.

The Special Department Committee announced that its efforts at the Health Department and the Tenement House Department have resulted in adjustment of activities there that will prove of benefit to the jobbing plumbers.

In a discussion of its activities the good work being done by the Board of Examining Plumbers was commended.

Former State Secretary and State Zone Delegate J. J. Dixon addressed the meeting, pointing out the benefits of free discussion, and he commended the committee's work.

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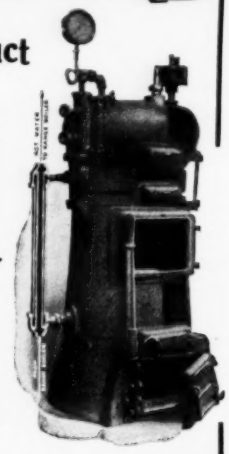

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When other fires are operating in conjunction, the Bungalow Heater can be closed off.

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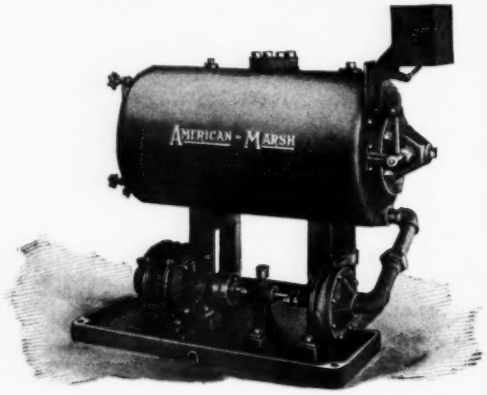

For use in returning the condensation to the boiler on heating systems where the steam pressure is too low to operate a steam pump. Water is returned to the boiler in its hottest state. Equipped with an automatic float valve which is positive and reliable. We also make a specialty of steam and motor driven vacuum pumps.

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Minnesota to Build Many Schools This Year.

Minnesota communities will go into the erection of school buildings at a lively rate the coming season, according to S. A. Challman, state commissioner of school buildings.

Sixty-five new building projects, involving an expenditure of more than $2,250,000, were brought into the commissioner's office for approval in the first quarter of the present year.

Among the larger projects are a new high school building in Austin, for about $200,000; a similar building in Moorhead for the same amount, and, in addition, a grade building for $50,000. Wilmar will build a high school for $130,000. Contracts have been awarded for a grade building in Mankato for $130,000, and for an addition at Bovey for $150,000.

Contracts for consolidated school buildings have been awarded in Chisago City for $35,000, and in Magnolia for $42,000. St. Louis County has awarded contracts for nine rural schools in the area burned over by the forest fire in October, at a cost of $40,000.

South Stillwater has begun the erection of a new $45,000 school. East Grand Forks will spend about $100,000 in rebuilding its high school, recently destroyed by fire. Waubun has voted $60,000 bonds for a new school house, and Campbell carried by a big majority a $75,000 bond issue.

Mountain Iron will spend more than $300,000 in three school buildings within the district. Duluth is planning four new buildings, at a total cost of $150,000. Buhl will build an addition to its high school and a grade building to cost about $150,000.

Other towns in the state, in which new school buildings at costs varying from $6,000 to $20,000 are under consideration, are: Victoria, Hawley, Morton, Round Lake, Starbuck, Pine Island, Winnebago, Long Prairie, Swanville, Blooming Prairie, Deer Creek, Watson, Howard, Lake, Cambridge, Lancaster, St. Hilaire, Bronson and Shelley.

Minneapolis and Vicinity.

Robert H. Utter, of 2538 Central Avenue, Minneapolis, has been awarded contracts for plumbing and gasfitting in thirteen bungalows that are being erected by the Peters Home Building Co., in various parts of this city.

M. J. Gillis, of 2914 Fifteenth Avenue, South, will install a hot water heating plant in the residence now being erected for H. L. McCoig & Co., at 4910 Dupont Avenue, South.

Sawyer & Smith, 2819 Hennepin Avenue, are installing plumbing and hot water heating in a building at 3310 Chicago Avenue, which is being remodeled into a duplex dwelling.

George K. Belden, the Minneapolis plumbing contractor, is also president of the Minneapolis Base Ball Club and is spending a few weeks in Texas with members of the team, while they are going through their spring training. George usually gets what he goes after, and if he wants the pennant in the American Association, the other teams will surely have to tie on their shoes and go some, his friends claim.

Harris Bros., of 8 West Lake Street, are just starting to install the plumbing and heating in three 25-apartment buildings.

There is a demand for modern homes in Minneapolis

and it is interesting to note that, whereas in years gone by it has been customary for several hundred carpenters and small contractors to start buildings late in the fall and then finish them during the winter, thereby having them ready for sale during March and April, the past winter saw very few such buildings erected, and the result is now apparent.

Master Plumber to Hunt and Fish in Style.

Harry C. Ridler, a plumbing contractor of Minneapolis, likes fishing and hunting, for all plumbing and no play gets mighty monotonous every day. But, according to the "Minneapolis Tribune," fishing and shooting have their drawbacks when it comes to accommodations, and poor sleep and uncertain meals cause inefficient fishing and hunting. So Mr. Ridler has just had built what he thinks is the first automobile camping schooner on wheels in the Northwest. Henceforth, he says, he and his friends are going to fish and hunt in style. This latest addition to Mr. Ridler's extensive sporting equipment is a combination kitchen and sleeping car that will overcome the difficulties generally encountered in his meanderings around the country. The main body of the car is equipped with cook stove, table, chairs, lunch box, drop windows and screens. For night use a false floor and sectional mattress slide into place and a bed big enough for three persons appears. In the driver's cab is space for a heater for fall and winter trips. The whole outfit weighs 3,350 pounds, or only 200 pounds more than the touring car in the first place. To complete his outfit he hitches on a trailer with boat, and away he goes.

California

San Francisco and Vicinity.

Supervisor Richard J. Welch, in returning to San Francisco from Sacramento, stated that many of the supervisors from San Francisco, Santa Clara, Santa Cruz and San Mateo counties are in favor of combining the counties in the construction of a tuberculosis sanitarium. The county of San Francisco has $50,000 available for the purpose, and it is Welch's plan to have the Board consider a joining of forces with the other counties.

It is understood that an exclusive Oriental hospital will be erected in San Francisco shortly. It is said that a tentative option is held on property at Eddy and Franklin Streets, as a possible site for the building, which is to cost in the neighborhood of $200,000.

The Hyde Street hill is to have another community apartment house. It is to be built on the east side of Hyde Street, between Greenwich and Lombard Streets, and will cost about $100,000.

A $50,000 apartment house is to be erected on the south side of Bush Street, near Leavenworth Street for L. B. Ham, of this city. Architect C. O. Clausen, Hearst Building, is taking segregated bids on the construction work of the building.

Other Cities in the State.

The firm of Whiting & Head has decided to open a furniture, hardware and plumbing establishment in Taft, similar to the one they now conduct in Los Angeles.

Arthur W. Place, proprietor of a plumbing shop and sheet metal works at Tulare, has sold one-half interest in the business to E. Palmquist.

It is understood that Vallejo is to have another hotel in the near future, and it is said that the construction of the building will be financed by local capital. The estimated cost of the hotel is in the neighborhood of $100,000.

Announcing

A Water System Without a Tank

First came the gravity systems—elevated and attic tanks, with all their troubles. Then came pneumatic tanks—a decided improvement, but with insallation expenses and problems of their own. Now the perfect water system—***no tank at all!*** Doing away with the tank, you have the simplest, lowest priced, dependable, automatic, power water system ever offered. IT IS THE

"WESTCO" TANKLESS

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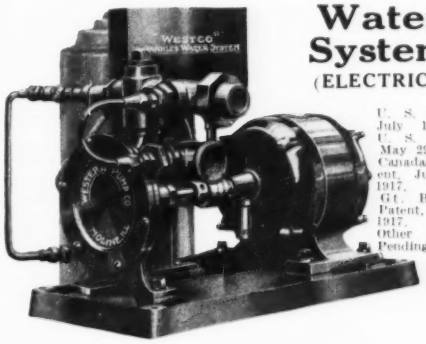

U. S. Patent, July 13, 1915
U. S. Patent, May 29, 1917.
Canada Patent, June 12, 1917.
Gt. Britain Patent, May 31, 1917.
Other Patents Pending.

The "WESTCO TANKLESS" water system is entirely automatic in its operation. Just pipe from pump to well or cistern and from pump direct to service line leading to plumbing. Then open any faucet and pump instantly delivers a full flow of fresh water under pressure. Close faucet and pump stops.

The heart of this water system, and the main factor in its success is the "WESTCO" pump. It is extremely simple—***only one moving part.*** It has the large, continuous flow and extreme simplicity of the simplest centrifugal pump; and it delivers the water at the high pressure necessary for first-class service.

The "WESTCO TANKLESS" electric system costs considerably less than other quality House Water Systems, yet has a wider range of service—smallest size will take care of a small farm. Larger sizes for any requirements.

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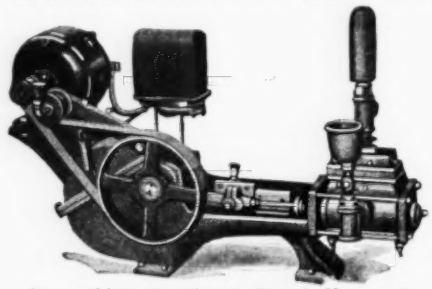
are practically NOISELESS—machinery cannot be built to run more quietly.

Gears are Machine Cut—not Cast—and run in oil. Bronze bushings throughout—no dead wear. Tobin bronze piston rod. Bronze Valve Seats. Removable brass liner in Pump Cylinder.

High Grade Construction in Every Part

Can be operated by very small electric motors or the little Reeco air-cooled gasoline engine, and with either Gravity or Reeco Pneumatic Tanks.

Prices no higher than on some of the cheaply built kind.



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Reeco System Water Supply Outfits

Gasoline and Kerosene Engines and Pumpers, Suction and Deep Well Pumps, Electric Pumps, Complete Pneumatic Tank Systems, Rider and Ericsson Hot Air Engines.

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Electric Weld **RANGE BOILER**

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Largest Manufacturers of Range Boilers in the World

A site has been chosen near Beresford for the new county hospital, which is to be separated from the almshouse. County Surveyor Geo. A. Kneese has estimated that the cost of furnishing water to the present county farm would be $22,000. He has been instructed to prepare plans for the water supply and bids will be advertised for. The estimate for the new hospital is $125,000.

An automatic sprinkler system is needed for the golf course at Griffith Park, Los Angeles. The estimated cost of the project is $20,000.

Two new bungalows for the Belvedere Hotel property of Santa Barbara, are now in course of construction. The cottages have eight rooms and six baths.

Oregon

Oregon Master Plumbers Planning for a Great Convention.

Elaborate plans are being made for the annual convention of the Oregon State Association of Master Plumbers, which is to be held May 10th, at Astoria, Ore., with headquarters at the Weinhard Hotel.

The up-state delegates will gather at Portland in time to join the Portland association in an all-night excursion on the Columbia on the evening of the 9th, arrangements for which have been made. The excursion boat will arrive at Astoria early on the morning of the 10th. This arrangement will mean quite a saving in fares for those living at a distance and provide a delightful opportunity for getting acquainted and for a preliminary social time.

It is fully expected that all the delegates, who are fortunate enough to be married, will bring their wives with them, and the Astoria association members are hard at work and propose to make this convention the best in the history of the state organization.

The morning session will be devoted to organization and committee work, the afternoon program to addresses and papers on business topics, and in the evening the annual banquet will be held in the banquet hall of the Weinhard Hotel.

The visiting ladies will be taken in charge by the local entertainment committee and autos provided for visiting all local points of interest.

It is planned to spend Sunday at the beaches, returning home by train or boat Sunday night. A special boat will leave up river at the close of the banquet.

Pennsylvania

Pittsburgh and Vicinity.

The McFadden & Craig Co. has the contract for plumbing work in the rectory and school for St. Ann's Roman Catholic Church, Chatsworth Avenue, Hazelwood. This company also has the contracts for plumbing work in the Kaufmann & Baer department store and the Davis theatre, and it is installing new toilet rooms in the plant of the Pittsburgh Valve Foundry & Construction Co.

An ordinance has been introduced in the McKeesport council for a large, new public comfort station, and it is expected that this work will be authorized shortly, owing to the urgent need for such an improvement.

Verner E. Warren, treasurer of the McFadden & Craig

Co., with M. Nirdlinger, R. M. Marlier, S. Catanzaro and W. M. Morganstern, has organized the Pittsburgh Homes Construction Co. The company will erect a number of handsome residence buildings in the Squirrel Hill district in the near future, all of which will contain two bathrooms with high grade plumbing fixtures, hot water heaters, heating and lighting equipment and garages.

H. W. Arthur, Pittsburgh representative of the Union Radiator Co., Johnstown, Pa., has moved his offices to 410 Empire Building.

Samuel F. Richards has been placed in charge of the heating department of the Anchor Sanitary Co. here, and will devote his entire time to this work. Mr. Richards formerly was connected with the engineering corps of the United States Steel Corporation, working on the Neville Island improvement for the Federal Government.

Capt. Sam Hollis, who was with the 107th Field Artillery, in France, and commanded Battery B., is expected home some time this month. He is a member of the plumbing firm of Hollis Bros., South Side. Capt. Hollis was in the thick of the fighting around the Marne district.

The E. F. Cass Plumbing Co. has the contract for plumbing in the new Sachs Building, at 6205 Frankstown Avenue, East Liberty. This company also has the plumbing contract for the machine shop addition to the Brunot's Island plant of the Duquesne Light Co.

The Knoxville Plumbing Co. has the plumbing contract for the cooler building in the Baur Bros.' bakery, at 6448 Pennsylvania Avenue.

The S. S. White Co., North Side, has completed the plumbing in several large buildings and reports an excellent year in 1918.

Stinson, Kennedy & Co., formerly of 121 Fourth Avenue, have moved to 216 Market Street, where they have larger and more attractive quarters.

Joseph A. Weldon, of the Weldon & Kelly Co., contracting plumbers, and former president of the Pittsburgh Builders' Exchange, has written an interesting letter from France to Paul G. Cass, of the E. F. Cass Plumbing Co. Mr. Weldon has been in Europe doing relief work for the Knights of Columbus. Among other things Mr. Weldon tells of the way they do plumbing in France, and, in his opinion, it is not up to the standard in this country. In the small towns and cities, he says, plumbing is very crude. He has done considerable traveling over the country and has addressed many gatherings of American soldier boys with cheerful messages. All the boys are homesick and anxious to get back to the best country on earth. According to Mr. Weldon, there is plenty of water in France—from the sky—but not much to drink. "Prices are very high," writes Mr. Weldon, "and it is hard to live in Paris for less than $40 a week." Enclosed with the letter is a copy of a paper called "Comrades of Service," which tells of an organization created by the soldiers. Mr. Weldon has been made treasurer and a member of the executive committee.

S. P. Trimble, president of the Builders' Exchange, is spending a couple of weeks resting at Hot Springs, Ark. He is accompanied by Mrs. Trimble. In his absence, D. T. Riffle, first vice president, is taking charge of all business meetings.

Building permits issued by the city of Pittsburgh during the month of March were greatly in excess of the number issued during the month of February and the estimated cost of work permitted during the period over twice that of the previous month. According to the monthly report of H. W. Minnemeyer, clerk of the department, 406 permits were issued for work costing about $982,715. These figures include 243 new buildings, estimated at $705,910; 114 alterations, at $201,774 and 49 additions, estimated at

Daily Report of Petromortis Victims in Garages

Are you responsible for any of these victims in your locality?

Contents of clipping below taken from the Chicago Tribune.

Motorist Killed by Gas from His Own Automobile

Lester C. Young, 43 years old, of 7914 Yale avenue was found dead in his garage at 7930 Princeton avenue last night, asphyxiated by gas from the exhaust of his automobile, which he was repairing. When he did not return home during the day his family notified the police, who found him dead on the garage floor.

FROM CHICAGO TRIBUNE
JANUARY 10th, 1919.

Install Dehn's "Peerless" Garage Drainage System to avoid similar experiences.

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Originators, Designers and Sole Manufacturers of

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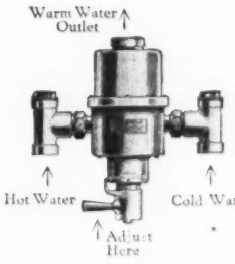
419-421 North Laramie Avenue
CHICAGO, ILL., - U. S. A.

Dependable Appliances

MADE IN U.S.A. POWERS THE POWERS REGULATOR CO. REGULATOR



THERMOSTATIC WATER CONTROLLER

For the control of water-line temperatures, for shower baths, etc., either singly or in gangs. The adjustment is simple and positive. Removes all danger of shock from failure of hot water, or scalding from failure of cold water, as it entirely shuts off the flow in either case. Used with great success in hospitals, for hydrotherapeutic treatments. Highly finished—an ornament in any bath room. Bulletins 124 and 134 give full information.

Ask us about any problem of Heat Control

The Powers Regulator Company

Specialists in Automatic Heat Control

952 Architects Bldg., New York
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MADE IN U.S.A. POWERS THE POWERS REGULATOR CO. REGULATOR

The Season Is Here

for the plumber to make big sales of water heaters. You not only make a good profit on each sale but every

HOFFMAN
Instantaneous Automatic Water Heater

you install will act as a business booster for you.

The HOFFMAN is simplest in construction and delivers more hot water for amount of gas consumed than any other heater on the market.

Write for details today.

The Hoffman Heater Co.
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Branch Offices in all Large Cities

Simplified Construction

This means simplified operation and reduces wear to the minimum.

ROYALY
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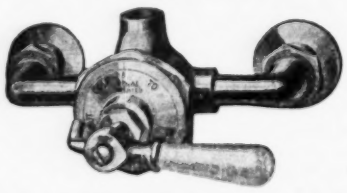


Shower Mixing Valve

has fewest working parts. No springs or cams to wear out. Regulating screw prevents water rising to scalding degree.

Substantially made of first grade red metal and will withstand hard usage usually required of a mixing valve.

Write for Catalog
THE ROYAL BRASS MFG. CO. CLEVELAND, OHIO

$75,031. Among the new operations are 63 dwellings, the cost of which is not estimated. In March last year 414 permits were issued, to cost $1,214,596. These last figures, however, included a large amount of industrial construction made necessary by the high pressure of war production.

Philadelphia and Vicinity.

J. J. Sites, Jr., of 2918 West Fletcher Street, has been awarded the contract to install plumbing and heating systems in a new factory that is being constructed at 2926 West Dauphin Street, for the International Tooth Co., the consideration being $10,000.

J. Borden & Bro., of 637 North Nineteenth Street, have been awarded the contract to install the heating system in a residence for J. Pyrah, at 6368 McCallum Street, Germantown, the amount of the contract being $1,875.

A. McBride & Bro., of Broad Street and Girard Avenue, have been awarded the contract to install heating and plumbing systems in a new dwelling, being built at 2034 North Seventh Street, for G. W. Fritz.

J. G. Schreiner, of 1434 Frankford Avenue, is underdraining several properties on Oxford Street.

Edward P. Biggans, of Twenty-sixth Street and LeHigh Avenue, has secured the contract to install the heating system in a new building at Twenty-fourth and Somerset Streets.

G. W. Wismer, of 523 North Fortieth Street, has been awarded the contract to install public drinking fountains for the city of Philadelphia.

Kentucky

Louisville and Vicinity.

In order to meet a loss of approximately $600,000 annually in license taxes, as a result of pending national prohibition, the City of Louisville is planning to adopt an ordinance under which license taxes will be imposed upon general merchants, manufacturers, professional men, etc. The ordinance is now before the General Council, but is causing a furor in some industries. Master plumbers are to pay $25 annually for the privilege of operating, and manufacturers will be taxed on the basis of the number of employes in their factories along a sliding scale. The tinner, stove repairer, hardware dealers and others come in for taxation, and where one man handles multiple lines he will face a fat young tax. Some of the plumbers feel that the license is unfair, especailly as it merely stipulates master plumbers, and would not hold down the handy man around a plant, or the journeyman who does odd jobs at odd times. The jobbers are also hit, as the license provides a sliding scale of taxes for all salesmen.

Business with the Louisville plumbers is generally good at this time, there being a good volume of repair work, small remodeling work, and some new work of small size. W. E. Glossop, City Building Inspector, is much encouraged by the total volume of small permits, which are running into interesting figures.

F. A. Clegg, of the F. A. Clegg & Co., heating and ventilating engineers, is a member of the committee on decorations of the Louisville Turngemeinde, which will have charge of entertaining the members of the American Gymnastic Association, the national body of Turners, when they meet in Louisville in June.

Judge Field, of the Jefferson Circuit Court, in deciding the long pending case of the members of the Louisville Master Plumbers' Association, gave peremptory instruc-

tions to a jury to find in favor of F. S. Schardein, president of the association, and forty odd members, against P. H. Meyer, of the firm of Scherich & Meyer, which firm had the sub-contract to handle the plumbing on Camp Taylor. Judge Field held that Mr. Meyer represented the plumbers and not himself. Mr. Scherich held a half interest in the original contract for about $40,000, and received his money when the work was finished. Not being able to handle the contract individually, he asked assistance from the plumbers' association, who in open meeting named Mr. Meyer as their representative to confer with Mr. Scherich and Mason & Hanger. The contract was secured under the firm name of Scherich & Meyer, and the master plumbers laid aside other work and completed construction on the camp, drawing regular salaries from the Government while doing so. When the work was completed Mr. Meyer claimed that he individually handled the one-half of the contract, and held that the association had nothing to do with the matter. Mason & Hanger refused to pay the money and deposited it with the Louisville Trust Co. until the matter could be settled. As a result of the court's decision the Master Plumbers' Association will pay Meyer the sum of $500 per month for a period of five months, as per their original offer for his services, and will split the remainder, about $17,500, among the membership that was in good standing at the time the contract was taken. Forty-one plumbers will receive a substantial amount of the proceeds of the job.

The congregation of the Church of St. Cecilia, Independence, Ky., will start the erection of a new church building in about thirty days.

Massachusetts

Boston and Vicinity.

The New England Sanitary Club, composed of jobbers from many sections of New England, met at Boston recently and elected Joseph H. Young, of Boston, president.

The Boston Vapor Heating Co. has just completed a $100,000 heating job for the New London Ship & Engine Co., at Groton, Conn. The heating system in the entire twelve buildings making up the plant was remodeled, the work being started last July. This company also has a $20,000 contract in the Holyoke Card & Paper Co.'s plant at Springfield.

The board of health at North Andover has organized and elected James M. Leitch as inspector of plumbing and George E. Jewett as assistant inspector.

The Craig & Wilkins Co., of Leominster, has been incorporated to conduct a plumbing business, with a capital of $20,000. The incorporators are: H. R. Higginbotham, president; Alger A. Craig, treasurer, and Euclid Grammont, secretary.

Architects Loring & Leland, of 7 Water Street, Boston, have been commissioned to draw plans for a $200,000 school house soon to be erected by the city of Waltham.

E. Edward Ludden, a plumbing and heating contractor of Weymouth, is erecting a store and office building at Washington Square, Weymouth.

H. B. Hatch, formerly of Forbes, Hatch & Co., plumbers and hardware dealers, at Easthampton, and later in the plumbing business for himself, has sold out to Harry Cruse.

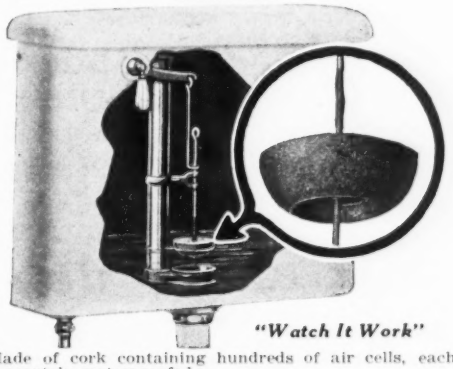
Bids are being received by the town of Athol for two new school buildings to cost about $20,000.

KOR KEI

Patents Pending

The Permanent Flush Ball

Guaranteed



"Watch It Work"

Made of cork containing hundreds of air cells, each separately waterproofed.
Guaranteed not to swell, rot or come apart.
Air boosts it up. Vacuum seats it.
Sizes to fit all Douglas type flush valves.
A winner on repair work.
Write nearest branch for particulars and prices.
Adjustable rod fits all top wires.
Quickest acting flush ball

The Universal Distributing Co., Inc.

Home Office: Detroit, Mich.

BRANCHES:

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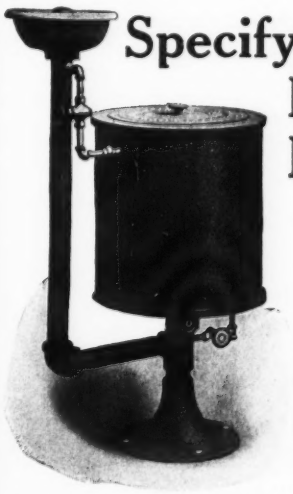


Specify Sanitary Bubbling Fountains

For Factory and Office Buildings

They Increase the Efficiency and Health of the Employes

Hundreds of America's largest concerns have their plants equipped throughout with these fountains in numbers running as high as 120 in a single installation. These fountains are for attachment to the municipal supply; are cork-jacketed, have 15½ coils of ½-inch brass pipe and will supply 150 persons. Many types for use with bubbler or glass with both or either.

Write for Catalogue

Covering our line of Wash Bowls, Metal Lockers, All Steel Stools and Chairs, with Inset Wood Seats, Stock and Storage Racks, Metal Shelving, Metal Vault Fixtures, Improved Soda Kettles, 40 and 60 gallons, Water Heaters and Instantaneous Mixers, Bubbling Drinking Fountains with or without Ice Coolers, Work Benches and Bench Legs, Drawing Stands, etc.

Manufacturing Equipment & Engineering Co.

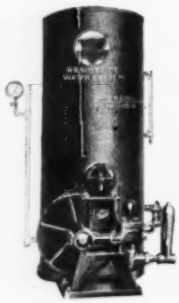
136 Federal Street, Boston, Mass.

Works and Mail Address: Framingham, Mass.

AN EVERY-DAY NEED

The Martin Portable Vise Stand and Pipe Bender fills an every-day need when cutting, threading or bending pipe. Can be moved anywhere. Easy to erect. Big time and labor saver. Ten days free trial. Write

H. P. MARTIN & SONS
626 E. 2nd St.
OWENSBORO, KY.



Your Job

Thousands of home owners all over this country want

"DURO"

Residence Water Systems—they've got the money to pay for them and are just waiting for you to sell them.

That's Your Job

Write or wire for nearest representative.

Makers of "DURO" Guaranteed Residence Water Systems.

GUARANTEED DURO MADE BY THE BURNETT-LARSH MANUFACTURING CO. DAYTON, OHIO

The Burnett-Larsh Manufacturing Co.
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MIBROCO PRODUCTS
OF SUPERIOR QUALITY

Asbestos Millboard	Asbestos Yarns
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Satinet Pure Asbestos Cement

MIKESELL BROTHERS COMPANY
156-178 North La Salle St., Chicago
Prices and Samples Cheerfully Furnished

THE BRUNSWICK-BALKE-COLLENDER CO.
WHALE-BONE-ITE
REG. PAT. OFFICE
CLOSET SEATS

THE EFFICIENT CLOSET SEAT

HEAVY COVERING ASSURES LIFE-LONG SERVICE — ACID-PROOF — IMPERVIOUS—STANDS ABUSE LIKE A BOWLING BALL — CONCEALED HINGES — INDISPUTABLE QUALITY

RECOMMEND THIS PROFIT MAKER

ASK YOUR JOBBER OR SEAT DEPT.

THE BRUNSWICK-BALKE-COLLENDER CO.
623 SO. WABASH AVE. CHICAGO

Connecticut

A final certificate of dissolution has been filed by the Sanitary Plumbing & Heating Co., of Danbury, by Andrew R. Jones, Frank F. Mead and a majority of the stockholders.

John McCloskey, of Derby, has secured the contract for installing modern plumbing in a house in that town for Edward Lembo.

The Hartford Heating & Tinning Co., of Wethersfield, has been incorporated. David Lesner is president; Rubin Simon, vice-president and secretary, and Essak P. Gabelman, is treasurer.

The plumbing business of M. J. Fahy & Sons, of Waterbury, has been incorporated by M. J. Fahy, John J. Fahy and Richard M. Fahy, all of Waterbury.

Henry Outhouse, a master plumber of 388 Main Street, Danbury, who has been critically ill for several weeks, is once more able to be about.

Mortimer S. Scofield, proprietor of the Danbury Plumbing Co., Danbury, underwent an operation at a local hospital early this month. The operation was successful and his quick recovery is anticipated.

CONTRACTS RECENTLY AWARDED.

Tulsa, Okla.—George Grinnel has been awarded the contract to install the heating system in a $55,000 high school at Pauls Valley, Okla.

Plymouth, Mich.—F. W. Hillman has been awarded the contracts to install the plumbing and heating systems in a bank being remodeled in that city.

Muskegon, Mich.—The Howden Co. has been awarded the contracts to install the plumbing and heating systems in a $35,000 high school at Muskegon Heights, Mich.

Youngstown, O.—Grolbert & Watson Co., of 100 East Thornton Street, has secured the contracts to install heating systems in 50 residences being erected in that city.

Des Moines, Ia.—Goff & Heger, of 724 Grand Avenue, have been awarded the contract to install modern plumbing in a $50,000 apartment building at 1725 Grand Avenue.

Denver, Colo.—Cullyford Plumbing & Heating Co., of 1520 Court Place, has secured the contracts to install the plumbing and heating systems in a $100,000 school at Center, Colo.

Boulder, Colo.—The City Plumbing & Heating Co. has been awarded the contract to install the plumbing and heating systems in a $35,000 school that is being built at Platteville, Colo.

Detroit, Mich.—The Otto Wurm Co. has secured the contracts to install the plumbing and heating systems in a $30,000 addition to a factory at Cameron Street and East Grand Boulevard.

Indianapolis, Ind.—Callon Bros., of 24 South Alabama Street, have secured the contracts to install the plumbing and heating systems in the Salvage Corps Building being built in that city.

Dubuque, Ia.—Linehan & Molo have secured the contracts to install the plumbing and heating systems in the Memorial University, which is being remodeled into a ward school. The contract amounts to $23,900.

Milwaukee, Wis.—Wenzel & Henoch, of 498 Twenty-seventh Street, have secured the contract to install the heating system in a 20-family addition to an apartment building at Prospect Avenue and Kenilworth Place.

The Pipe Market.

(Continued from Page 73.)

On extra strong and double extra strong genuine wrought iron pipe, with plain ends, and in less than car lots, the quotations are as follows:

	Extra Strong				Double Extra Strong			
	Butt Weld		Lap Weld		Butt Weld		Lap Weld	
	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.
⅛ to ⅜ inch	14½	+10½	.....	.....	.....	.....	.....	.....
½ inch	19½	+5½	.....	.....	.....	.....	.....	.....
¾ and 1 inch	25½	½	.....	.....	.....	.....	.....	.....
1¼ inch	25½	½	.....	.....	.....	.....	.....	.....
1½ inch	25½	½	.....	.....	.....	.....	.....	.....
2 inch	.....	.....	19½	+5½	.....	.....	.....	.....
2½ to 4 inch	.....	.....	21½	+3½	.....	.....	.....	.....
4½ to 6 inch	.....	.....	20½	+4½	.....	.....	.....	.....
7 to 8 inch	.....	.....	10½	+14½	.....	.....	.....	.....
9 to 12 inch	.....	.....	5½	+19½	.....	.....	.....	.....

These retail prices are f. o. b. Pittsburgh, and apply to all quantities except in car lots. With threads only, the basing discount is one and one-half points lower. With threads and couplings, the basing discount is three points lower.

To ascertain the price in your city, deduct the proper less-than-carload freight rate from Pittsburgh to that city. Example: Base price on ¾-inch black steel pipe is 50½ per cent, Pittsburgh, the less-than-carload rate to Patson is 17 cents, and the price, therefore, freight allowed to Patson, 48⅝ per cent; on galvanized, 33⅝ per cent. All other sizes to be figured on a comparative basis.

Chicago Old Metal Market.

Chicago wholesale dealers' prices are nominally as follows:

	Buying.	Selling.
Heavy yellow brass	7½ to 8 cents	8½ cents
Brass, light	6½ to 7 cents	7½ cents
Brass, medium	7¼ to 7¾ cents	8 cents
Red brass	12½ to 13 cents	13½ cents
Cocks and faucets	11 to 11½ cents	12 cents
Copper, heavy	13½ to 14 cents	14½ cents
Lead, heavy	4¼ to 4½ cents	5 cents
Tea lead	3¼ to 3½ cents	4½ cents
Zinc	3½ to 3¾ cents	5 cents
Solder joints	11 to 11½ cents	12½ cents
Mixed babbitt	5½ to 6½ cents	7 cents
Aluminum clippings	20½ to 21½ cents	22½ cents
No. 1 pewter	35 to 40 cents	42 cents
Old iron pipes per ton	$13.00	$13.50

LATE NEWS FROM VIRGINIA.

Norfolk and Vicinity.

Architect Philip B. Moser, of the Law Building, is preparing plans for a store, flats and oil station at Colonial and Twenty-third Streets, to cost about $20,000.

Lowe & Sawyer, of 418 Thirty-first Street, are having plans drawn for several residences.

A. E. Goehring, of 556 Thirty-sixth Street, is having plans drawn for several bungalows on Maryland Avenue.

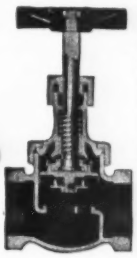
J. C. Brooks & Co., of Bute and Smith Streets, are having plans drawn for a $32,000 residence on Chapel Street.

Architects Peebles & Ferguson, of Law Building, have prepared plans for a bank and office building on Plume Street, to cost about $65,000.

J. G. Lancaster, of Bank Street, has been awarded the contract for plumbing in a residence on Thirty-seventh Street.

J. J. Butler, of Monticello Avenue, has been awarded the contract for installing heating and plumbing systems in a store at Lambert's Point.

MARSH
UNION BONNET
DOUBLE SEAT
VALVES



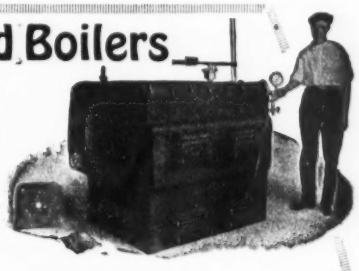
While we furnish a full line of high pressure Mill Supply Globe, Angle, and Gate Valves, we Specialize on High Grade Radiator Valves, and manufacture the Largest Line of any company in this, or any other country.

ALL STYLES AND SIZES

Let us send you catalogue showing line complete and quote prices on your requirements.

MARSH VALVE CO. - - Erie, Pa.

Bernhard Boilers



have water tubes in fire box where they come in contact with the intense heat. Upon striking these tubes, flames spread and transmit heat to water from all directions.

There are nineteen other specific reasons why you should Install Bernhard Boilers. Investigate.

KANAWHA MFG. COMPANY
175 W. Jackson Blvd., Chicago
101 Park Avenue, New York Charleston, West Virginia
Michigan Representative: G. V. Hepburn, 25 Rochester Place, Grand Rapids, Mich.

SIMPLICITY

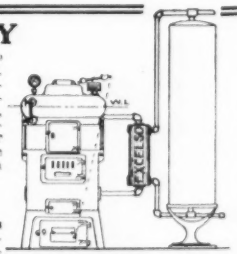
In construction, the Excelso Water Heater is in a class by itself. Consists of a one-piece casting having two separate chambers, the inner one of which is corrugated, forming an extensive heating surface. The steam or boiling water in this chamber heats rapidly the domestic water circulating through outer chamber.

EXCELSO
Water Heater

No interference with firing. Does away with troublesome coil in firepot. Furnishes hot water constantly day and night at very little cost.

Easy to connect to any boiler. Can be used either in vertical or horizontal position.

Write for Booklet

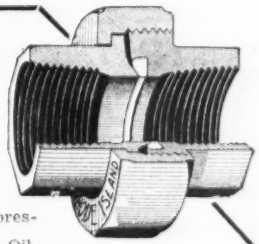


Showing Heater Connected to a Vertical Type Boiler.

Three sizes—tank capacities, 40, 70 and 100 gals. for use below water line. Heats storage tanks up to 800 gals. with live steam.

EXCELSO SPECIALTY WORKS
1377 MAIN STREET BUFFALO, NEW YORK

Rhode Island Union



Positive Joint
Bronze Seat
No Packing
No Gasket

Guaranteed 300 lbs. working pressure.

For Steam, Water, Gas and Oil.
The best is cheapest in the end—use the

RHODE ISLAND

Write for Catalog.

RHODE ISLAND FITTINGS COMPANY
HILLS GROVE, R. I.

The Milwaukee Mixer

Anti-Scalding
Leak-Proof

Accessible
Durable

No Cams

No Springs

Made to suit
all conditions

Order from
your jobber

Fig. C-15

The Milwaukee Flush Valve Co.
MILWAUKEE, WISCONSIN
Specialists in the Manufacture of Valves

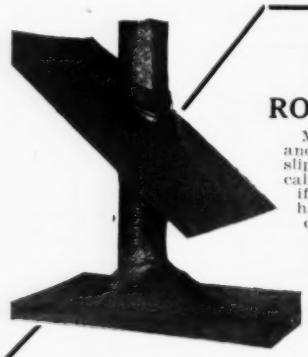
HAYNES SELLING COMPANY

Heating Specialists

Modulated and Vacuum Heating Systems Adapted for all Types of Buildings

Over 25 Years' Experience

1711 Sansom Street Philadelphia, Pa.



Y-T
ROOF FLASHER

Makes a water-tight joint and a perfect fit. When slipped over soil pipe, can be calked as absolutely tight as if poured in place. Flasher has patented cast iron caulking base.

Furnished in all sizes from 1¼ to 6-in. for angle and flat roofs.

Write for folder.

The Yoder-Thomas Mfg. Co.
1024 B. of L. E. Bldg.
CLEVELAND, OHIO

NIEDECKEN MIXER

For
Shower
Lavatory
Bath
Sink
Etc.

Write for Bulletin D-10-X

HOFFMANN & BILLINGS MFG. CO.
MILWAUKEE

HEATING AND VENTILATING A NATIONAL ISSUE.

(Continued from Page 49.)

mechanical appliances for ventilation. Living and sleeping rooms, even of the dormitory kind, can be effectively ventilated by opening windows liberally if ample room is allotted per person. Interior and underground rooms, without windows opening directly outdoors, should not be permitted to be used for living and sleeping quarters under any conditions.

Ample provision should be made so that each and every room used for living and sleeping purposes can be heated to a comfortable temperature in the most severe weather. Sleeping rooms, which may usually be kept at somewhat lower temperatures, still require ample provisions for warming in cases of illness. The recognized average standard for living quarters is 70 degrees F., and it would be well to adhere to this standard, so as to have a certain surplus that will permit windows to be kept partly open.

Hot water, steam, furnace and open fireplace heating, and even stoves, can be considered satisfactory when ample in capacity and properly installed. Individual control of the heating for each room is very important, so that the heat can be distributed in accordance with requirements. Gas radiators and oil stoves, which release products of combustion should be prohibited for permanent heating of living and sleeping rooms, as they produce disagreeable and injurious gases.

Overheating is a prevalent evil. For ordinary rooms, an average temperature of 68 degrees F., is, from the standpoint of health, preferable, except where there are aged people who require a slightly higher temperature. For sleeping rooms, a much lower temperature will suffice, except in cases of illness.

These standards will answer until the suggested bureau of research is created when additional and more definite ones can be made and measuring methods be devised for the establishment of *quality* standards to supersede the present *quantity* standards.

Special provisions for ventilating public halls, school rooms, et cetera, are not contested with the antagonism formerly manifested. The war has furnished a striking illustration of what can be accomplished by proper sanitation. Employers and owners of industrial establishments should coöperate with proper authorities to develop the best means of heating and ventilating.

SOMETHING ABOUT BACK-VENTING PLUMBING FIXTURES IN LARGE TOILET ROOMS.

(Continued from Page 52.)

The back venting of slop sinks may be accomplished as shown in Fig. 5. The waste stack is 3-inch. It may be 4-inch, but with a 3-inch vent stack, the increased suction of a 3-inch waste stack can easily be neutralized with a 3-inch vent. The stacks are cross connected, and an outlet sanitary tee is placed in the cross connection at a suitable height for a P trap for the slop sink. This arrangement is very simple and certainly is perfectly sanitary. It is also neat in appearance and quite mechanical as far as construction is concerned. It is common practice on the best of work.

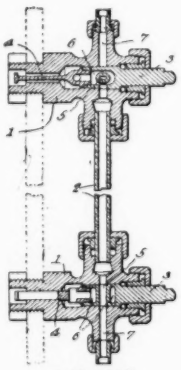
Lemuel Elway, of the Elway-Miller Co., plumbing contractors in Aberdeen, Wash., died a short time ago at his home in that city.

Patents

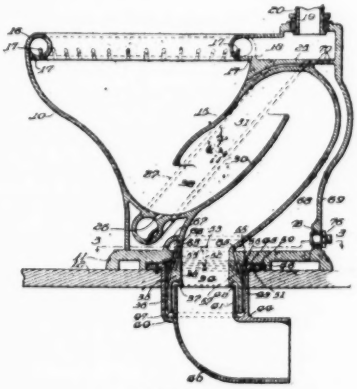
Plumbing Department.

1,294,568. Water-Gage. Yoshiuji Tajima, Higashinari-Gun, Osaka-Fu, Japan. A water gage valve comprising a plug having a hollow space therein, said hollow space having one opening communicating with the boiler and another opening adapted to be brought into communication with the gage glass, an opening and closing pipe disposed across the said hollow space at right angles to the longitudinal axis of the plug and adapted to communicate with or be isolated from the interior of the gage glass, substantially as set forth.

1, 294,421. Water Closet. John J. Daly, Philadelphia, Pa. In a water closet the combination with a stool comprising a bowl, and a discharge duct leading from said bowl and said stool being provided with a passage surrounding said duct, of a discharge pipe arranged beneath said stool detachably connected thereto and forming therewith a trap-shaped passage communicating with said first mentioned passage and with the interior of said discharge pipe, said bowl being provided with means for admitting water into said first mentioned passage and with an opening through an exterior wall thereof and in alinement with said first mentioned passage to permit of the cleaning of said first mentioned passage, and removable means normally closing said opening.



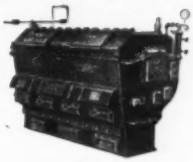
1,294,568.



1,294,421.

1,294,515. Strap Wrench. Peter Monahan, Paterson, N. J., assignor to Harry R. Sinclair, Worcester, Mass. In a strap wrench, the combination with a handle having a pointed clamping nose at one end and provided with a plurality of transverse apertures situated at different distances from the nose, of a shackle, means to pivotally secure said shackle into any one of said apertures, and a strap secured at one end to said shackle and adapted to be passed around the nose and then around a pipe and to have the other end thereof inserted between the first-named end and said nose, the adjustment of the shackle into different apertures providing for bringing different portions of the end of the strap which is secured to the shackle into position to receive the strain due to bending said portion of the strap over the pointed nose.

1,295,369. Attachment for Shower Baths. Hugh B. Pitcher, Boonton, N. J. A shower bath including a

ECONOMY  EFFICIENCY

This is a
Pierce Down Draft, Magazine Feed, Smoke Consuming, Heating Boiler
Saves Fuel Labor
Manufactured only by
PIERCE, BUTLER & PIERCE MANUFACTURING CORP.
Brooklyn Boston Worcester NEW YORK Syracuse Philadelphia Baltimore Washington

Myers House Pumps

Whenever you are called upon to furnish a customer a house pump for his kitchen, back porch or some other place, remember the Myers House Pumps are neat of design, nicely finished, well built with many improvements, come in a number of different styles and sizes, are easy to operate, have large capacity and prove satisfactory for home use or for other purposes.

An exceptionally strong line—considered standard in the pump world—and a sales producer for dealers and plumbers. Circular and prices to the trade.

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Cock Hole Cover *and* **SINK BACK HOLDER**

for Holding Sink Backs

for Closing Cock Hole

WOLVERINE BRASS WORKS
Manufacturers
GRAND RAPIDS, MICH. SAN FRANCISCO, CALIF.

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WHEN
Building Bigger Business
Install **"SANIDOME"**
Bibbs, Bath and Basin Cocks
Your Customer Will Pay More and Make More Profit For You
Write for information
THE HAYDENVILLE COMPANY
HAYDENVILLE, MASS.

SX
DRAINAGE FITTINGS
WATCH for our half-page Announcement in the April 19th Issue of DOMESTIC ENGINEERING.
ESSEX FOUNDRY, Murray St. and Avenue "D", Newark, N. J.

"NATIONAL"
Is the Recognized Standard of Wrought Pipe Quality for plumbing requirements.
NATIONAL TUBE COMPANY PITTSBURGH, PA.

Base Section When Used Without Ring Section.
Champion Auxiliary Heater
Fits any hot air furnace. Increases heating capacity. A business-getter and profit-maker. Try it.
Order from Your Jobber
or write to
Frank D. Stolz Co.
3127 N. Clark St. CHICAGO

BETHALTO WATER SYSTEMS
Answer every need of Kitchen, Dairy, Garden and Farm. They furnish running water, clear, cold and plentiful, fresh from the bottom of your well or cistern.
Dealers and Plumbers handling BETHALTO control the business in their territory. Write for literature and proposition.
SOUTHERN AUTO & MACHINERY CO., 115 Robert Ave. ST. LOUIS, MO.

A good bench is just as important as a good workman. The best bench at the lowest cost is what you want. The stiffest, strongest, handiest and most durable and the quickest to move. Drop us a line and we will send you a list of customers, from the largest corporations to the smallest, who are saving big money, using our
STANDARD PORTABLE VISE BENCH
STANDARD IRON WORKS, Inc.
508-10 E. 74th Street, New York City

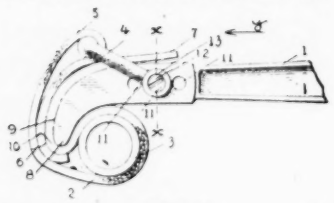
Chas. F. Hause Mfg. Co., Inc.
Manufacturers of
Iron Pipe Joint Cement
Sets like Gum. Allows no Leaks.
Liquid and Powder Form.
Ask your Jobber—or write us direct.
1812 St. Marys Ave. Omaha, Nebr.

Largest Makers of
Pneumatic and Storage Tanks
Ask for Catalogue No. 69
KEWANEE BOILER COMPANY
KEWANEE, ILLINOIS

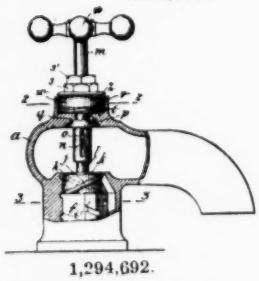
TRADE A.S.M.Co MARK
Nickel Plated Brass Specialties
Manufactured by
American Sanitary Mfg. Co.
Abingdon, Ill.

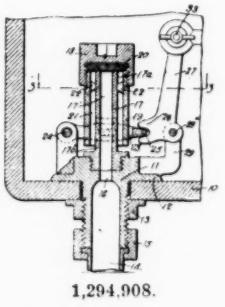
spherical bearing constituting a nipple adapted to fit in the nozzle outlet of a faucet, an outlet leading from said nipple, an upstanding pipe carried by the connection and in fluid communication with said outlet, and a depending hanger for supporting said nipple in angularly adjusted position from an element of the faucet positioned above the nozzle.

1,294,692. Tap or Valve. William Edgar Muntz, London, England. A tap or valve comprising an exterior casing having an inlet orifice at one end and an outlet orifice at the other end, a dividing wall in the casing between the orifices, a coned circular orifice in the said wall, grooves, forming ribs between them, in the interior wall of the casing, which grooves are of varying sectional area starting from the larger circumference of the coned orifice where their depth is zero and gradually increasing as they extend toward the inlet orifice, an externally threaded plug complementarily engaging the said ribs, a coned nose on one end of said plug adapted to be seated in the coned orifice in the said dividing wall, a stem on said plug, a spindle within the casing, one end of which spindle, in permanent engagement with the said stem, forms therewith a loose telescopic claw coupling having adequate side play and the other end of said spindle terminating in a detachable handle without the casing, a coned boss on said spindle intermediate the coupling and the handle, the larger end of which boss is toward the coupling, a coned recess within the casing located around the opening through which the spindle passes from the interior to the exterior of the casing and into which the coned boss is ground, and means for holding the coned boss to its seat comprising lock nuts on the spindle and a spiral spring around the spindle on the exterior of the casing, one end of which abuts against the said nuts and the other end against the casing.


1,295,369.

1,294,515.

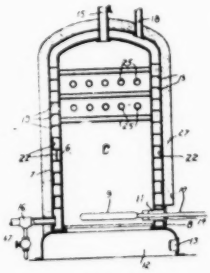

1,294,692.


1,294,908.

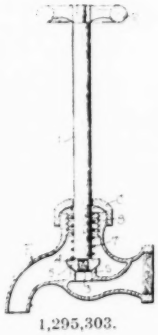
1,294,908. Flush-Tank Valve. Elijah R. Hill, New Albany, Miss. In a flush-tank valve, the combination of a spud having a standard carried by one side thereof, a bell crank pivoted to the standard, a float ball connected to the bell crank, a valve seat nozzle extending upward from the spud, the base portion of the nozzle being polygonal while the upper portion thereof is cylindrical, the diameter of the upper portion being the same as the smallest diameter of the base portion, a valve fitted upon and slidable up and down along the nozzle, said valve comprising a hollow cylindrical sleeve of uniform cross section, a head fixed to the upper end of the sleeve and a packing

member carried within the head and co-operating directly with the valve seat, and means co-operating with the valve and actuated by the bell crank on the fall of the water level in the tank to open the valve.

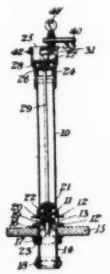
1,295,125. Water Heater. Edward T. Curran, Detroit, Mich. In a water heater, nested and spaced apart dome shaped shells, the interior of the inner shell constituting a combustion chamber and the space between the shells a water jacket having an inlet adjacent the bottom and an outlet at the top; and annular superposed partitions in the water jacket to separate said jacket into superposed chambers to provide a circuitous passage from end to end of the jacket, said partitions comprising annular members extending between the inner and outer walls of the water jacket having flanges at right angles to said members to support and space successive partitions from the next lower partition, and each partition having a portion cut away to provide an opening to connect adjacent chambers.



1,295,125.



1,295,303.



1,295,789.

1,295,303. Valve Grinder. James J. Gorman, Durango, Colo. Means for reseating the internal seat of a faucet comprising a shaft freely insertible through the cap of the faucet and capable of direct endwise movement, a grinding disk detachably engaged with the end portion of the shaft within the faucet, the outer faces of said disk being provided with an annular beveled surface engagable with the internal valve seat for grinding the same, and a spiral spring surrounding the shaft and contacting with the grinding disk, said spring being of such a length as to contact with the under faces of the cap of the faucet for placing said spring under compression when the cap is engaged with the faucet, the outer end of the shaft being provided with a hand grasp for rotating the same.

1,295,789. Ball Cock. Abram N. Pasman, Waterbury, Conn., assignor to the American Pin Co., Waterbury, Conn., a corporation of Connecticut. A ball cock comprising a body member, a base secured at one end thereof, a valve within said base, a head member secured to the other end of the body member and having an open-ended well therein, a piston within the head member, a rod connecting the valve and piston, a flange associated with the piston and lying within the well in the head member, the said flange being of greater diameter than the piston but of less diameter than the well in the head member, and means for simultaneously operating the said piston and valve.

1,295,610. Tank Water Heater. Gerhardt F. Schwartz, St. Louis, Mo. In a tank water heater, a water tank provided with a central upright core having a lower cylindrical portion of relatively large diameter, and an upper cylindrical portion of smaller diameter than said lower portion, a circulating water coil connected with the tank and arranged in said core, and having a lower portion

Pop-Up Pop-Up Pop-Up
FOR
BUILT IN BATH TUBS
GOETZ BRASS COMPANY
630 N. FRANKLIN ST. CHICAGO, ILL.

HOFFMAN VALVES
more heat from less coal
An air venting valve for every service—made entirely of metal; absolutely automatic; absolutely non-adjustable. Guaranteed for five years. Write for catalog.
HOFFMAN SPECIALTY CO., Inc., 512 Fifth Ave., New York City

"HAAS" WATER CLOSETS
are high grade, insuring maximum service and minimum expense
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LITTLE GIANT EXPANSION SCREW
Insure permanent expansion the entire length of screw inserted. Expansion begins at first turn of screw, screw making its own thread. No pipe sleeves or wedge nut required. For machinery, electrical work, steam and gas pipe, hanging signs, slate, marble or tile work, the LITTLE GIANT is best.
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Pressweld Radiation
Cheaper to ship. Cheaper to install. Gives lasting satisfaction and saves money for you and the owner. Write Dept. "I" for catalog at once.
American Pressweld Radiator Corporation
Detroit, Michigan

Plumbers Specialties
Brass Goods for the Plumbing Trade
Closet Tank and Seat Trimmings, Connected Waste and Overflows, Traps, Supply Pipes, etc.
Any Reliable Jobber can furnish the "Famco" Line from stock
Frost Manufacturing Co., Kenosha, Wis.

Write for Prices

WROUGHT IRON STRAPS
Scientific construction makes these straps stronger, lighter, better in appearance.—MORE PIECES TO THE POUND—Consequently lower in price.
BERGER BROS. CO.
229-231-237 Arch Street
PHILADELPHIA

Make it Automatic
Simply attach the Hotstream Regulator to ANY water boiler and gas heater —makes the supply of hot water entirely automatic—furnishes hot water 24 hours a day. Does the work of the expensive automatic heaters at a fraction of their cost.
Send for descriptive folder.
The Hotstream Heater Co. 1375 E. 17th St., Cleveland, O.
"Makers of Heaters that Heat"

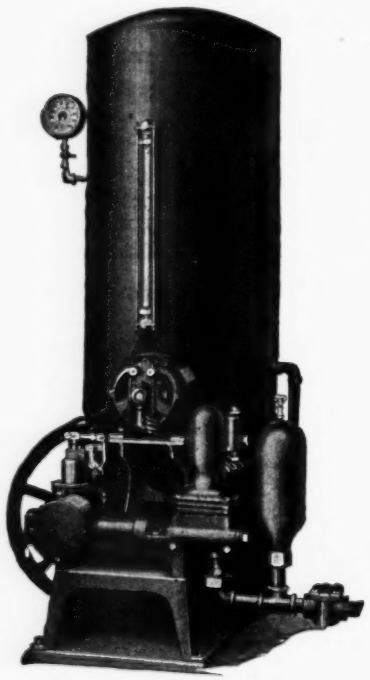
Wherever there is a farm lighting system, there is a live prospect for the

ROBERTS "GEM"
Electric Driven Pump

When the farmer or owner of a country home once knows the advantage of using electric current, you can easily sell him a complete water supply system.

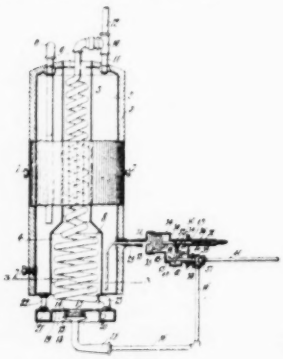
ROBERTS Pumps will supply water for all general purposes, from a shallow well or cistern, lake or stream, and are economical in use of current.

Why not be the ROBERTS Pump man in your town? Write for particulars.

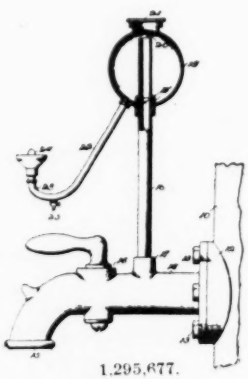


The GEO. J. ROBERTS CO.
DAYTON, OHIO

having superimposed equal diameter convolutions of relatively large diameter, said lower portion of said coil terminating within said lower cylindrical portion of said core, and an upper portion having superimposed equal diameter convolutions of relatively small diameter and extending through said upper portion of said core, the diameter of the clear space surrounded by the lower portion of the coil being greater than the outer diameter of the upper coil portion, and heating means located beneath said tank and coil.



1,295,610

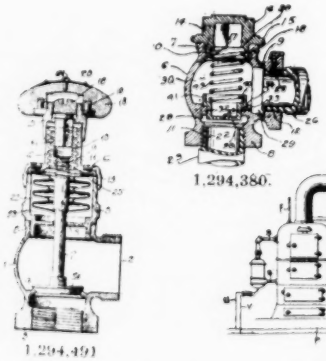


1,295,677.

1,295,677. Combined Pump Spout and Drinking Fountain. George H. Bell, White Sulphur Springs, Mont. The combination with a discharge spout having a cut-off valve, of a reservoir having a closure, a conductor having one end thereof communicating with the discharge spout at a point between the valve and the source of supply and its other end extended within the reservoir to a point beneath the closure thereof, a mouth piece and a downwardly inclined conductor forming a connection between the reservoir and mouth piece.

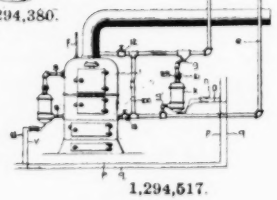
Heating Department.

1,294,380. Vacuum Heating System. Edgar O. Benson, Cranston, R. I. In a device of the character described, the combination with a hollow casing provided with an inlet opening and an outlet opening, a partition across the outlet opening provided with a hole, a check member comprising a side wall loose in said hole, a bottom provided with a central opening, and a shoulder resting on the partition, and a spring resting on said shoulder.



1,294,491

1,294,380.



1,294,517.

1,294,517. Heating System. Phillips B. Motley, Westmount, Quebec, Canada. The combination with a primary system for heating buildings by hot water circulation such system comprising a furnace, radiator and a pipe circuit consisting of flow and return mains connecting said furnace and radiator, of an electric heat gene-

rator and pipe of relatively small bore connecting the outlet and inlet ends of the generator to the flow and return mains respectively, the pipe connecting the outlet end of the said generator to the flow main being disposed at an oblique angle to the latter, means controlling the flow through said pipe, a by-pass connecting said flow and return mains between the heat generator and the furnace, a valve in said by-pass and valves in the flow and return mains between the by-pass and furnace.

1,294,491. Valve. Joseph P. Lavigne, Detroit, Mich. In a valve, a casing, a closure controlling flow therethrough provided with a longitudinally reciprocable stem, a packing chamber detachably mounted on the casing through which the stem extends, a longitudinally collapsible drum hermetically secured at the lower end to the stem, a flared flange on the upper edge of the drum resting on the end face of the packing chamber, a bushing having a base flange resting on the drum flange, a holding ring screw-threaded onto the packing chamber and arranged to clamp the base flange of the bushing onto the drum flange, a sleeve interiorly screw-threaded to engage the stem and exteriorly screw-threaded to engage in the bushing, a handle plate in non-rotatable, telescopic engagement with the sleeve.

ALL INJURED AMERICANS PARTICIPATE.

Men Who Served Under Flags of Allies May Now Receive Same Retraining as if Disabled Under Stars and Stripes.

Soldiers who were disabled in the service of the armies of our Allies may now receive the same vocational retraining as men of the United States forces. The Federal Board for Vocational Education at Washington is desirous of locating all such men, and requests that citizens who know of such men will furnish their addresses to the Board so that these soldiers may be given their chance of rehabilitation.

It is a case where there seems utterly no way of reaching these men except to appeal to citizens to help seek them out. The United States has as yet no record of its citizens wounded in armies of the Allies. It is common knowledge that the total enlistment was large, and there are doubtless hundreds of these men, disabled through their service to the common cause and who until now have not been eligible for relief.

Out of a fund provided by the Elks these American citizens, injured under a foreign flag but in our cause may now receive the same opportunities and benefits as are given our own soldiers, sailors and marines.

"Nobody Home" With Him.

"Why didn't you send your man to mend my electric door bell, as you promised?"

"He did go, madame; but as he rang three times and got no answer he concluded that there was nobody home."—"Boston Transcript."

"Good morning, judge," said the prisoner, cheerfully. "You seem in a good humor for a man who has spent the night in jail." "So I am, your honor. I had a good night's rest and that always refreshes me. You see, my wife is a timorous woman and when I sleep at home I'm compelled to investigate many strange noises. No doubt there were burglars all around me last night, but I didn't have to get out of bed and look for them."—"Birmingham Age-Herald."

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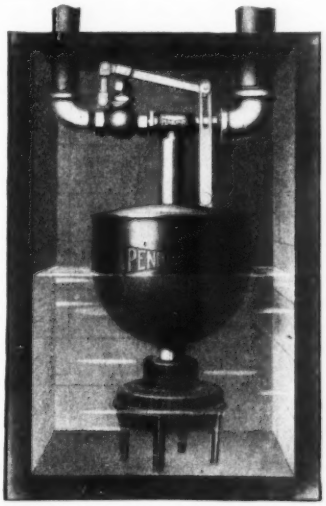
AUTOMATIC

Cellar Drainer

is equivalent to an insurance policy for protection of property against surplus water.

Entirely automatic. Needs no attention or auxiliary power.



All Working Parts Above Water

There is no possibility of clogging with slime or sediment. Will not rust or corrode. No leather washers.

Now is the time to look up the homes in your neighborhood that are not protected against flood water and install the Penberthy Drainer. The perfect continuous service it gives, more than justifies the investment.

Made in a wide range of sizes and capacities.

Ask your jobber for the Penberthy.

Penberthy Injector Company

(Established 1886)

DETROIT, MICH.

New York Depot:
71 Beekman Street

Canadian Factory:
Windsor, Ont.

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The charge for advertisements under this heading is 6 cents a word, including heading and address; $1.00 minimum. To insure insertion, copy and remittance should reach us by Wednesday morning.

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WANTED—SALESMEN TO HANDLE our line of plumbers', steamfitters' and Anglyn brand brass goods, on commission basis. Territory in every state. Write Angster & Lynch, Newark, N. J. 2-22tf

WANTED—SHOWROOM AND SPECIFICation man familiar with high grade plumbing fixtures, to call on architects and building contractors. Opportunity for alert, capable man with a live, growing wholesale house. Address 2634, care "Domestic Engineering", Chicago. 4-12

WANTED—SALESMAN TO HANDLE our plumbing specialties in Cook County, Ills., on commission basis. Reference required. A good opportunity for a live man to make a handsome income. Cooper Sanitary Mfg Co., 34th and Chestnut Sts., Philadelphia, Pa 4-12; 19

WANTED—OLD ESTABLISHED JOBber of heating and plumbing supplies, requires a good traveling salesman, one fully experienced, to whom an excellent opportunity is offered. Office salesman or correspondent in Sales Office also needed. Address 2631, care "Domestic Engineering," Chicago. 4-5-12

CATALOGUE COMPILER WANTED—thoroughly experienced party to compile plumbing, heating and water supply system catalogue. Must be thoroughly acquainted with all materials entering in each the above lines. State age, full qualifications, past experience and remuneration desired. Address 2636, care "Domestic Engineering", Chicago. 4-12; 19

WANTED—SALESMAN, PLUMBER OR steamfitter who can invest $5,000 in established heating specialty company. Positions to represent the company in the following territories are open: Wilkes-Barre, Pa., Pittsburgh, Pa., Buffalo, N. Y., Chicago, Ill., Detroit, Mich., New York City. Good salary to start. Do not answer unless you can make the investment. Address 2623, care "Domestic Engineering," Chicago. 3-22 tf.

Situations Wanted.

WANTED—POSITION WITH JOBBING house. Thoroughly posted Fittings and Brass Goods. Best references. Address 2633, care "Domestic Engineering," Chicago 4-5, 12, 19

SITUATION WANTED—AS SUPERINtendent of a plumbing and heating shop. Wide experience as mechanic and business ability. A producer. Address 2637, care "Domestic Engineering," Chicago. 4-12

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FOR SALE—A BARGAIN IF TAKEN AT once. 30 vitreous lavatories 18x20, similar to Crane B-282. With or without fixtures. All are new and first class. Address 2635, care "Domestic Engineering", Chicago 4-12

SALE OF GOVERNMENT-OWNED BAR solder. 49,000 lbs. ⅜" sq. x 14" long—45% tin, 55% lead, F. O. B. Baltimore, Md. Bids will be opened 10 A. M. May 1, 1919 at War Dept., Surplus Property Div., Munitions Bldg., Washington, D. C., for 1,000 lbs. or more. Samples, full particulars and special bid forms on hand at above office and Zone Supply Offices in following cities: New York, Baltimore, Philadelphia, Boston, Chicago, St. Louis, Jeffersonville, New Orleans, Atlanta. Refer to S. P. D. No. 748 RM. 4-12

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SELL YOUR SURPLUS COUPLINGS and fittings. Write us. The A. & J. Mfg. Co., 557 W. Lake St., Chicago. tf

WE BUY AND SELL USED PLUMBing and heating material. D. B. Plumbing & Heating Sales Co., Ft. Wayne, Ind. 2-1 tf

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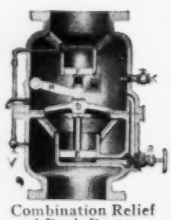
For Returned Sodiers, Sailors and Marines

The "Situations Wanted" Department of "Domestic Engineering" is open to returned soldiers, sailors and marines, who are in need of employment, for free insertion of advertisement. When sending advertisement, please state briefly and clearly the position you seek, with your qualifications. Replies can be sent direct to you or care of "Domestic Engineering", whichever you desire.

PLUMBING AND HEATING COST Keeping Blanks, Time Sheets, Job Tickets, Order Books, Material Slips, Estimate Sheets, Contract Blanks, Fitting Bin Markers. Send stamp for free samples. Haddon Specialty Co., Haddon Heights, N. J. 1-11;25

ILLUSTRATED STATIONERY AND advertising for plumbing and heating trade, at reasonable prices. Large assortment of cuts; prompt delivery. Samples and price list mailed the minute your request arrives. P. Fink & Sons, Mail Order Printers, 56 N. 7th St., Philadelphia, Pa. 2-15 tf

AGENTS WANTED—I HAVE SOME good territory open for hustlers to sell the Phelps Sectional Smoke Consuming Boilers and the Jumbo Series of the same boiler. These boilers rate from 1,900 ft. steam to 30,000 ft. I will give exclusive territory and expect you to sell no other Smokeless boiler. Homer D. Phelps, 2719 Moyer Ave., Des Moines, Iowa. 3-22



Combination Relief and Back Pressure Valve. Sizes, 4 in. to 36 in.

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Eclipse STEAM SPECIALTIES

For 35 Years the STANDARD

Automatic Regulating Valves and devices for every service and steam pressure. Write for Bulletins.

Vacuum Type Reducing Valve. All sizes and types.

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You will find it a SERVICE THAT SERVES.